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Natural Resource
Conservation Service

Regents of the University of
California (Agricultural
Experiment Station)

Soil Survey

Sequoia National Forest California



How To Use This Soil Survey

General Soil Map

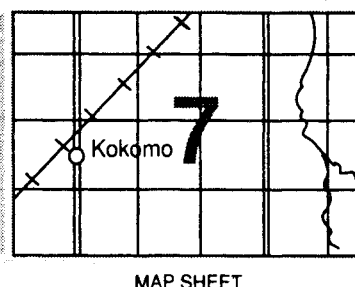
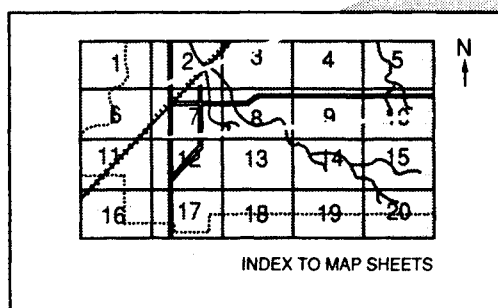
The general soil map, which is the small scale map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

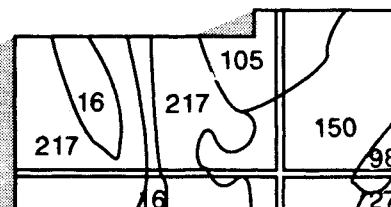
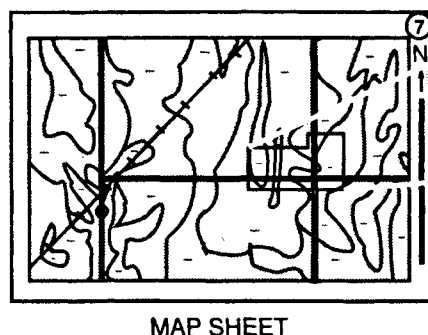
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

Sequoia National Forest Area, California

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, and state agencies including the Agricultural Experiment Stations. The fieldwork and technical quality control for this survey were conducted by the Forest Service. The correlation of the soils was conducted by the Soil Conservation Service in consultation with the Forest Service. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of the program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1973-79. Soil names and descriptions were approved in 1981. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Forest Service and the Soil Conservation Service. The soil survey area consists of the Sequoia National Forest and the part of the Inyo National Forest in Tulare County.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: View of Giant Sequoia

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Forward


The Soil Survey of Sequoia National Forest Area, California, in parts of Fresno, Kern, and Tulare Counties, was designed to facilitate broad forestwide resource management planning and to increase the knowledge of our environment. It contains predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil.

This soil survey has been prepared primarily for forest resource planners and managers. It is useful for preliminary project planning, for identifying general soil management considerations, and for evaluation of more intensive soil survey needs. The survey should be used for detailed resource management planning and project level planning and design only after field verification.

Great differences in soil properties can occur even within short distances. Soil may be shallow to bedrock and incapable of producing commercial timber. They may be seasonally wet or subject to flooding. A low available water capacity makes a soil poorly suited to reforestation. A high water table makes a soil suitable for use as summer range.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each soil map unit is shown on detailed soil maps. Each kind of soil in the survey area is described, and information is given about each soil for specific uses.

This soil survey can be useful in the conservation, improvement, and productive use of soil, water, and other resources.



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Location of Sequoia National Forest Area, California

Soil Survey of Sequoia National Forest Area, California

By Richard O. Hanes, Sarah E. Plocher and Dan Z. Martynn

Fieldwork by Terry V. Brock, James T. Bayer, Richard O. Hanes, and R.L. Watson, Forest Service

General Nature of the Survey Area

This section briefly discusses Sierra Nevada geomorphology, and the physiography, drainage, geology, climate, and vegetation of the survey area

Sierra Nevada Geomorphology

The Sierra Nevada mountain range, which makes up the province, runs in a northwesterly direction, turning southwest at the southern end. The crest of the range climbs from 8,000 feet in the north to Mt. Whitney and rival peaks in the south which rise over 14,000 feet. In cross section, the asymmetrical Sierra range slopes gently to the western slope as the marine air masses move inland and are forced up and over the range. Deeply incised river canyons drain this well watered side of the range. The eastern scarp is in a rain shadow and has shorter, steeper canyons.

The present form of the Sierra Nevada mountains is a recent development. Today's range is the product of hundreds of millions of years of geologic work. From about 230 to 420 million years ago the area that is now the Sierra Nevadas was under a shallow sea. Great quantities of coarse, unsorted sediment and volcanic debris accumulated, causing the sea bed to sink. These continental and marine sediments were lithified to form a complex series of paleozoic rocks.

About 132 million years ago these rocks were raised and deformed into a northwest trending fold. Lava rose under the fold and mixed with the rocks to form the huge granitic batholith-over 400 miles long, 80 miles wide and 12 miles thick. The area eroded long for millions of years to form a broad upland of low hills and deep gorges.

About 25 million years ago, a period of deformation and volcanic activity began. The eastern edge was lifted along the Sierra Nevada fault and the batholith was tilted to the west. Volcanoes covered the northern and

central part of the range under a blanket of lava and continual erosion modified the surface. About 3 million years ago the final uplift brought the range to their present height.

During the ice ages within the last one million years, the crest of the Sierra Nevada was extensively glaciated. The last glacial period ended 25,000 to 11,000 years ago and extended as far south as the headwaters of the Little Kern River.

Physiography, Drainage and Geology

The Sequoia National Forest Soil Survey Area is at the southern end of the Sierra range where it turns southern to close off the Great Valley. Cirque Peak At 12,910 feet on the northern boundary of the Golden Trout Wilderness is the highest point in the survey area. The lowest point is 990 feet at the south-western corner where the Kern River leaves the National Forest.

Four major rivers drain the survey area. The Kings, Kaweah, and Tule Rivers flow almost due west through deep canyons in the western portion of the Area. The Kern River, with its headwaters near Mt. Whitney flows due south 70 miles before turning westward to the San Joaquin Valley. The Kern drained the central and eastern portions of the survey area and is impounded at Lake Isabella.

The deep Kern River Canyon separates the southern portion of the survey area into distinct regions. The Breckenridge Mountains are separated from the Greenhorn Mountains as the river turns westward from Lake Isabella. The Breckenridge Mountains are characterized by oak grasslands at the low elevation, a chaparral zone and a small area of commercial timber at the high elevations.

Upstream from Lake Isabella, the South Fork of the Kern River divides the Piute Mountains and Scodie

Mountains from the Kern Plateau. The Piutes are similar to the Breckenridge Mountains but have a larger commercial forest zone. The eastern portion of the Piutes exhibits the desert influence, supporting Joshua tree and Pinyon Pine. The Scodie Mountains are a distinct desert mountain region.

The North Fork of the Kern River divides the Greenhorn Mountains from the Kern Plateau. The Greenhorns rise from the floor of the San Joaquin Valley with oak-grass lands at low elevations, an extensive chaparral belt at mid elevations and a broad belt of commercial forest land at higher elevations. On some of the highest mountains there are subalpine trees and shrubs. The eastern side of the Greenhorn Mountains drops steeply into the Kern River Canyon.

The Kern Plateau region is across the upper Kern Canyon from the Greenhorn range. This mountainous "Plateau" is generally covered by mixed conifer forests with red fir forests at higher elevations. Subalpine trees and shrubs grow on the highest mountain tops.

The northern island of the survey area, the Hume Lake Ranger District, is isolated by administrative rather than geomorphic boundaries. The lines are drawn to separate National Park land from National Forest land.

The rock units in the survey area include metamorphic, plutonic and volcanic rocks. These materials range in age from recent to more than 135,000,000 years old (pre-cretaceous).

The granitic batholith which forms the body of the Sierra Nevada is composed of many smaller "plutons," each formed by a separate intrusion. The granitic rock in the plutons varies in composition. "Granitic rock" is a general term which includes several rock types with differing combinations of quartz, micas and feldspars. Intrusive igneous rocks in the survey area range from true granite to grandiorite.

The granitic rocks weather in several different forms. At high elevations water seeps into fractures, freezes and expands, hewing off chunks of virtually unweathered granite. In some places bald granitic domes are formed by exfoliation or "leafing away" of layers of rock. The Dome Land Wilderness in the southern Kern Plateau takes its name from the many domes in that area weathers in place by chemical and physical means leaving coarse individual mineral grains.

Volcanic rocks are uncommon in the Survey Area, but where they occur, they are mostly flows of dark gray olivine basalt. Tertiary volcanic rocks occur on the southern Kern Plateau, in the area of the Forks of the

Kern River, and the Hume Lake Ranger District. In addition, Monache Mountain and Templeton Mountain on formed the northern Kern Plateau are volcanic. These are andesite domes by the extrusion of molten rock.

The metamorphic rock in the survey area consists of undifferentiated metasedimentary and metavolcanic rocks. These rocks form roof pendants and are remnants of the ancient lake bed that once covered the Sierra. The formations include such rocks as phyllite, quartzite, schist, marble, gneiss, and metamorphosed pyroclastics. The roof pendants are scattered throughout the survey area.

Recent alluvial deposits occur in the survey area in the form of alluvial fans, stream terraces, upland meadows, and colluvial deposits.

There are no faults classified as "active" within the survey area. The Kern Canyon fault which trends north-south, runs from the headwaters of the Kern, through Lake Isabella and on south between the Breckenridge and the Piute Mountains. From Lake Isabella northward the Kern River has cut its canyon in the zone weakened by the fault stress. Other faults occur, but none so prominent.

Climate

Generally, the survey area is characterized by a Mediterranean climate with cool, moist winters and warm, dry summers.

Mean annual precipitation ranges from 10 to 50 inches, with 79 to 90 percent of it falling between November and April when evapotranspiration is at a minimum. In the montane and subalpine areas, most of the precipitation during this period is in the form of snow. Snowmelt rates range from rapid to moderate, with approximately 60 percent of the area having rapid snowmelt.

Rainfall intensities range from moderate to high. Approximately one-half of the commercial forest land is in the high intensity class, with rates of 6 to 7 inches in 24 hours. These events occur once within a 5-year period. The balance of the area receive 2 to 6 inches in 24 hours.

Potential evapotranspiration (PET) is the return of water vapor to the atmosphere through evaporation and transpiration when water supply is not a limiting factor (i.e. the soil would always contain more water than the plants need).

The average values of PET by plant community have not been determined for the survey area, however, the

following information (1) (3) is relatively useful (Figure 1).

The Growing Season¹

The growing season for most foothill plants coincides with the rainy months from autumn through spring. By mid-summer all but the most drought-resistant foothill plants, or those growing near perennial source of moisture—riverbanks, for example—become dormant and remain so until the arrival of rain in the fall. Trees and shrubs may simply shut down operations for the duration of the dry season; most herbs are annuals which scatter their seeds before the drought begins. Since most foothill plants are active during the winters, they are subject to periodic frosts, which they routinely survive.

Above the foothills, persistent winter snow cover shifts the growing season to the summer months. Although the disappearance of snow cover in the spring and its reappearance in the fall determines the outer possible limits of the growing season, onset and end of growth for most plants is actually triggered by other factors. Each species has particular requirements with regard to such factors as air temperature, soil temperature, soil moisture, and the number of hours of sunlight each day, all of which must be met before dormancy is broken. Plants thereby reduce the possibility of commencing growth too soon—as during a dry winter, when snow might be absent in places but air temperatures and daylight hours insufficient for survival. During a normal winter, it is rising air temperature, of course, that is primarily responsible for the melting of

the snowpack, and this event in turn profoundly affects soil temperatures and moisture levels.

Since air temperatures drop as elevation increases, the growing season also becomes shorter, beginning progressively later and ending progressively earlier as one moves upslope. The length of the growing season for each vegetation zone in the Sierra (including the Central Valley as a point of comparison) is roughly as follows:

| | |
|-----------------------|----------------|
| Central Valley | 7-11 months |
| Foothill zone | 6-10 months |
| Lower montane zone | 4-7 months |
| Upper montane zone | 3-4 1/2 months |
| Subalpine zone | 7-9 weeks |
| Alpine zone | 6-8 weeks |
| Pinyon-Sagebrush zone | 2-5 months |

The relatively unimportant role of frost in determining these growing seasons is apparent when one considers that during the 3-4 1/2 months available for plant growth in the upper montane zone, the frost-free period is only 40-70 days long. In the subalpine and alpine zones, there are no frost-free periods.

Although the first permanent snow of autumn marks the latest dates at which plant growth is possible in the upper zone, most species have begun to shut down for the winter by the time storms arrive. Once again, as with the breaking of dormancy in the spring or early summer, air temperature, soil moisture, and the number of daylight hours are as important as snow in determining its resumption in the late summer or early autumn.

Figure 1. Average Annual PET by Plant Community

| Vegetation Type | Potential Evapotranspiration Inches | PET as a Percentage of Mean Annual Precipitation |
|-----------------|-------------------------------------------|--------------------------------------------------------|
| Pinyon-Juniper | 15 | 97 |
| Grass | 16 | -- |
| Foothill | 18 | 69 |
| Lodgepole Pine | 19 | 58 |
| Mixed Chaparral | 20 | 77 |
| Mixed Conifer | 22 | 51 |
| True Fir | 24 | 34 |

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Vegetation

Plant community names used in the report are based on the traditional plant communities in A California Flora (5) (6) and The Vascular Plant Communities of California (8). The following is a list of the plant communities in the survey area and the series that may be in each plant community. The plant series names are based on CALVEG, A Classification of California Vegetation (7). All of the series given for a plant community may not be on a specific site under that community.

Yellow Pine Forest Community - the plant series in this community are Ponderosa Pine, Jeffrey Pine, Mixed Conifer-pine, Mixed Conifer-fir, Western Juniper, Digger Pine, Pinyon Pine, Quaking Aspen, Black Oak, Canyon Live Oak, Valley Oak, Ceanothus, Manzanita, Prunus, Mt. Mahogany, Bush Chinquapin, Mt. Misery, Shin-oak, Basin Sagebrush, Bitterbrush, Rabbitbrush, Wild Rose, Bromegrass, Fescue, Muhlenbergia, Needlegrass, Wild Rye, and Fern.

Mixed Conifer Forest Community - the plant series in this community are Pondersosa Pine, Jeffrey Pine, Big Tree, Mixed Conifer-pine, Mixed Conifer-fir, White Fir, White Fir, Black Oak, Ceanothus, Manaznita, Prunus, Bush Chinquapin, Mt. Misery, Wild Rose, Wild Rye, and Fern.

White Fir Forest Community - the plant series in the this community are Big Tree, Mixed Conifer-fir, White Fir, Red Fir, Lodgepole Pine, Ceanothus, Manzanita, Prunus, Brush Chinquapin, Mt. Misery, and Wild Rye.

Red Fir Forest Community - the plant series un the community are Red Fir, Western White Pine, Lodgepole, Quaking Aspen, Ceanothus, Manzanita, Prunus, Bush Chinquapin, and Wild Rye.

Lodgepole Pine Forest Community - the plant series in this community are Western White Pine, Lodgepole Pine, Quaking Aspen, and Fern.

Foxtail-Limber Pine Community - the plant series in this community are Western Juniper, Lodgepole Pine,

Limber Pine, Foxtail Pine, Mt. Mahogany, Rabbitbrush, and Fern.

Mixed Chaparral Community - the plant series in this community are California Bay, Canyon Live Oak, Interior Live Oak, Chamise, Ceanothus, Manzanita, Mt. Mahogany, Shin-Oak, Scrub Oak, Bromegrass, and Fern.

Montane Chaparral Community - the plant series in this community are Canyon Live Oak, Ceanothus, Manzanita, Prunus, Mt. Mahogany, Bush Chinquapin, Mt. Misery, Shin-Oak, Scrub Oak, Basin Sagebrush, Bitterbrush, Rabbitbrush, Bromegrass, and Fern

Piute Cypress Woodland Community - the plant series in this community are Digger Pine, Piute Cypress, California Juniper, Ceanothus, Manzanita, Mt. Mahogany, Rabbitbrush, Needlegrass, and Fern.

Pinyon-Juniper Woodland Community - the plant series in this community are Pinyon Pine, California Juniper, Mt. Mahogany, California Salvia, Basin Sagebrush, Bitterbrush, Rabbitbrush, Opuntia, Needlegrass, Ricegrass, and Fern.

Foothill Woodland Community - the plant series in this community are Digger Pine, California Bay, Bigleaf Maple, Canyon Live Oak, Interior Live Oak, Blue Oak, Valley Oak, Sycamore-Ash, California Buckeye, Ceanothus, Manzanita, California Buckwheat, Encelia, Bromegrass, Fescue, Muhlenbergia, Needlegrass, Wild Oats, and Fern.

Joshua Tree Woodland Community - the plant series in this community are Joshua Tree, Opuntia, Bromegrass, and Ricegrass.

Sagebrush Scrub Community - the plant series in this community are Western Juniper, California Buckwheat, Salvia, Saltbush, Basin Sagebrush, Bitterbrush, Rabbitbrush, Opuntia, Bromegrass, Needlegrass, and Ricegrass.

Montane Meadow Community - the plant series in this community are Lodgrpole Pine, Willow, Mulenbergia, Sedge, Wiregrass, and Fern.

How this Survey was Made

This Order 3 soil survey (9) has followed the directives and guidelines in the Forest Service Manual and Handbooks. It has also followed the concepts, procedures, and guidelines of the National Cooperative Soil Survey as specified in the *Soil Survey Manual* (12), the *National Soils Handbook* (11), and the soil classification system as stated in *Soil Taxonomy* (13).

Soil Scientists begin the inventory by collecting, studying, and correlating all the existing data and information concerning the survey area (National Forest) that is related to soil genesis and morphology. This includes lithological, geomorphological, topographical and elevational, climatic, vegetative, and existing soil survey data both within and adjoining the survey area.

This data and information was assimilated and transferred to a single base map of suitable scale and accuracy forming the beginning soil map unit delineations or a schematic map. With the schematic map and aerial photo field sheets (stereo-pair coverage) in hand, the soil scientist made a reconnaissance study of the survey area. At this time, the delineations on the schematic map are checked for accuracy of content and location. The aerial photos were studied stereoscopically and the photo images were compared to the conditions found on the ground to insure that later recognition by photo interpretation would be credible. Lithologic, geomorphic, soil, and vegetative characteristics were recognized and recorded in field notes, on the schematic map, and on the aerial photo field sheets.

Using the augmented and corrected schematic map, field notes, and an understanding of how the photo images relate to actual conditions on the ground, the soil scientist delineated map units on the aerial photographs. The map units corresponded to segments of the landscape having similar landform, vegetative cover, and soils as determined by a knowledge of ground conditions and by stereoscopic aerial photo interpretation. These aerial photos with the delineated map units and delineation symbols became the exploratory or preliminary soils map.

With the aerial photo (exploratory soils maps) and a field stereoscope in hand, the soil scientist examined on the ground as many delineations of each map unit as was feasibly possible, considering the access and time allowed to complete the survey. In this way, each different map unit was examined, studied, and described by aerial photo interpretations and on-the-ground investigation. However, because of the design of the survey, Order 3 in intensity (9), and the time allotted for its completion, every delineation of each different map unit was not

visited and examined on the ground. Those delineations with no easy access were rarely visited other than by aerial photo interpretation. In this way, possibly one-third to one-half of the delineations on the field sheets and maps would not have been entered and examined by an on-the-ground investigation. *This is one of the main aspects of this survey that limits its reliability. It is one reason that the survey is not suitable for project planning without field verification.*

As each map unit was visited and examined, individual soils were recognized, studied, described, classified, and enough data was collected to furnish the information needed to make interpretations and predictions concerning the use and management of each soil. *However, the exact location of each soil was not delineated.* The map units usually consist of a group of soils that occupy a particular portion of the landscape which has been delineated on the aerial photo field sheets. Depending on the area location and extent of the individual soils that are components of the delineated map unit, a map unit is called an association or complex of soil components. The soil scientist makes a field and aerial photo examination to estimate the soil component percentage composition for each map unit. These map units *do not* necessarily consist of similar soils. They consist of geographically associated soils that may be, and usually are, quite different in their characteristics and suitability for use and management. *These are other aspects of the survey that limit its reliability and make it not suitable for project planning without field verification.*

This field examination and study, and the associated correction and refinement of the aerial photo field sheets, produces the Order 3 intensity soil maps called for in this system of survey.

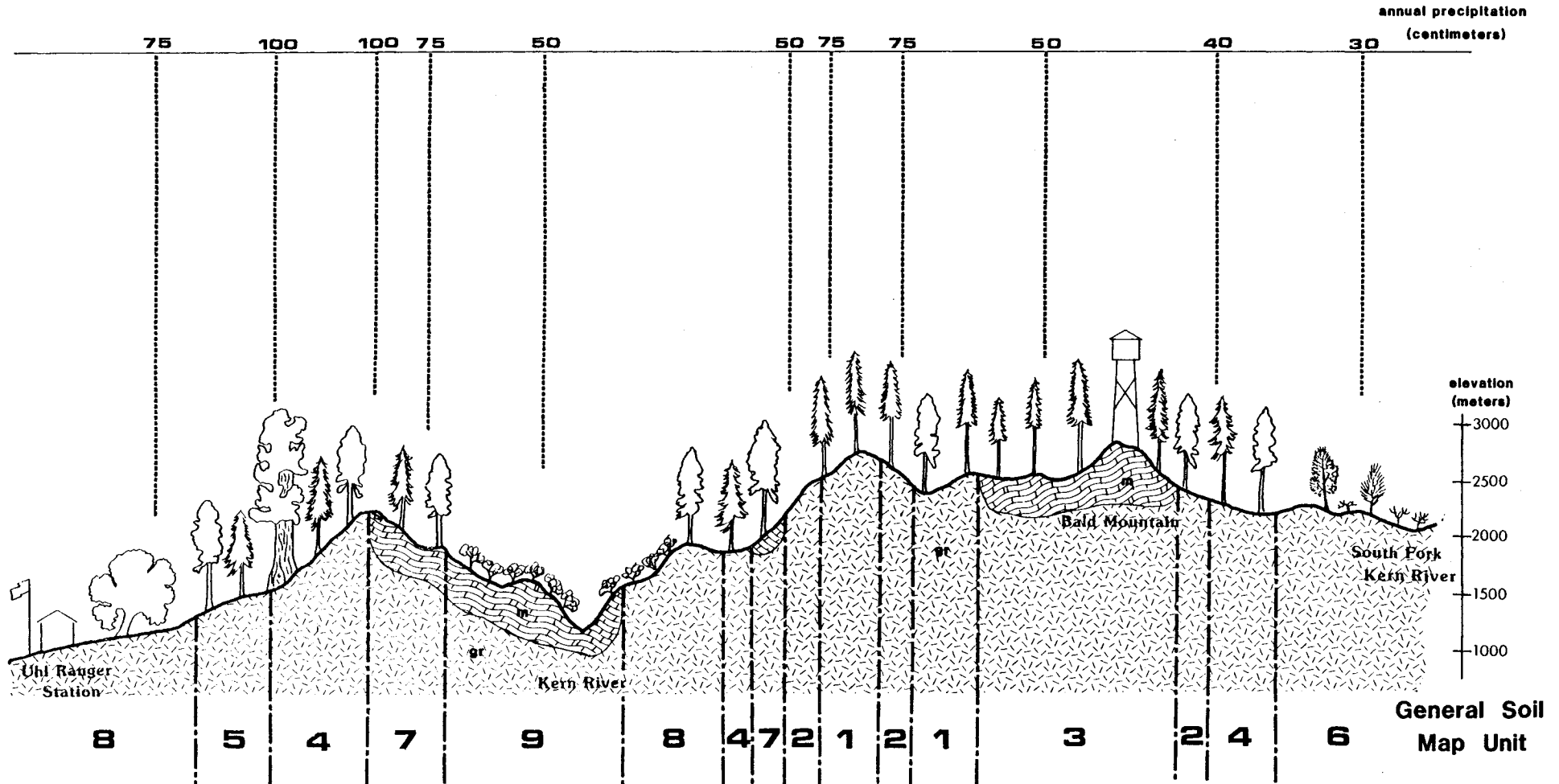
The interpretations and predictions concerning use and management found in this report are based on the soil scientist's knowledge and understanding of the conditions recognized and measured in the time allotted to this inventory. By classifying the soils, the soil scientist can also, with acceptable reliability, bring information concerning use and management of a particular soil from other survey areas where this same soil occurs and has been recognized and studied. Because of the time allocation for the completion of this survey, these use and management interpretations and predictions should be considered as first or second approximations due to the relatively few examinations and measurements that have been made. *This is still another aspect of the survey that limits its reliability and makes it not suitable for project planning without field verification.*

Despite the cautions that have been made in the above paragraphs concerning the use of this survey information

for project level planning, it is adequate and reliable for its intended and designed purpose: a base for a Forest-

wide system of land management planning.

PHYSIOGRAPHIC PROFILE



General Soil Map Units

The general soil map units which consist of many individual soils. Each map unit contains soil with similar parent rock material and similar soil temperature regimes. A map unit typically is made up of one or more soils of major extent and several soils of minor extent. Map units are named for the major soils occurring in the unit. The soils in one unit can occur in other units. The soils are classified at the series level, family level, or at a higher taxonomic level.

The map furnishes a broad perspective of the soils in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. General areas which are capable of timber production or spring-summer range can be identified on the map. Likewise, general areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of the generalization of map units and the small scale of the map, the location of specific soils are not shown. The map and map unit information is not suitable for Forest or project level land management planning. They give a very general overview of soil conditions and are suitable for State or Regional planning.

Each of the 10 map units are described in the following pages. Figure 2 - Physiographic Profile shows the general landscape, elevation, and precipitation for each general soil map unit.

1. Cagwin-Toem-Rock outcrop

Moderately deep and shallow, excessively drained soils, and Rock outcrop; on mountainsides and ridges.

The map unit occurs on mountainsides and ridges. The soils formed in residuum from highly weathered granitic rock. Elevation ranges from 6,400 to 9,910 feet and the means annual precipitation ranges from 12 to 51 inches.

The major plant communities in this unit are Red Fir Forest, Lodgepole Pine Forest, Montane Chaparral, and Foxtail-Limber Pine Forest.

This unit makes up approximately 10 percent of the survey area. It is about 45 percent Cagwin soils, 25 percent Toem soils, and 15 percent Rock outcrop. The remaining 15 percent consists of minor components.

Cagwin soils are moderately deep and excessively drained. Slopes range from 5 to 75 percent. Typically, the profile is loamy sand over highly weathered granitic rock.

Toem soils are shallow and excessively drained. Slopes range from 5 to 75 percent. Typically, they have a loamy sand surface layer. The underlying material is loamy sand over highly weathered granitic rock.

Rock outcrop may occur as small isolated outcroppings or as massive exposures.

Minor components in this unit are the deep and well drained Nanny family and Cannell soils, the excessively drained Chesaw family and Sirretta soils, and the Monache and Monache Variant, drained soils that are under meadows.

Areas of this unit are used for limited summer range and limited timber production. Forage and timber production are reduced by areas of Rock outcrop and the low available water capacity of the shallow soils.

2. Rock outcrop-Cannell-Sirretta

Rock outcrop and, deep and moderately deep, well and excessively drained soils; on mountainsides and ridges.

This map unit occurs on mountainsides and ridges. The soils formed in residuum from highly weathered granitic rock. Elevation ranges from 5,580 to 10,600 feet and the mean annual precipitation ranges from 18 to 53 inches.

The major plant community in this unit are Red Fir Forest, Lodgepole Pine Forest, Montane Chaparral, White Fir Forest, and Foxtail-Limber Pine Forest.

This unit makes up approximately 8 percent of the survey area. It is about 25 percent Rock outcrop, 25 percent Cannell soils, and 15 percent Sierra soils. The remaining 35 percent consist of minor components.

Rock outcrop may occur as small isolated outcroppings or as massive exposures.

Cannell soils are deep and well drained. Slopes range from 5 to 75 percent. Typically, they have a sandy loam surface layer. The underlying material is sandy loam over highly weathered granitic rock.

Sierra soils are moderately deep and excessively drained. Slopes range from 5 to 75 percent. Typically, the surface layer is coarse sandy loam. The underlying material is very gravelly loamy sand over fractured hard granitic rock. This soils is 35 to 90 percent gravel and cobbles.

Minor components in this unit are the deep and rocky Nanny family soils, moderately deep and excessively drained Cagwin soils, warmer Chaix and Dome soils,

and the Monache, Monache Variant, and Monache Variant, drained soils that are under meadows.

Areas of this unit are used for timber production. Rock outcrop and rock fragment in soil limit potential timber productivity and impede harvest. Forage production is limited by areas of Rock outcrop and rock fragments in the soil, and by competition from conifers and shrubs.

3. Baldmountain-Rock outcrop-Glean Variant

Deep, well and somewhat excessively drained soils, and Rock outcrop; on mountainsides and ridges.

This map unit occurs on mountainsides and ridges. The soils formed in residuum from metasedimentary, undifferentiated metamorphic, or basic igneous rock. Elevation ranges from 6,790 to 10,010 feet and the mean annual precipitation ranges from 18 to 39 inches.

The major plant communities in this unit are Yellow Pine Forest, White Fir Forest, Red Fir Forest, and Montane Chaparral.

The unit makes up approximately 3 percent of the survey area. It is about 45 percent Baldmountain soils, 30 percent Rock outcrop, and 10 percent Glean Variant soils, 30 percent consists of minor components.

Baldmountain soils are deep and well drained. Slopes range from 5 to 75 percent. The surface texture is silt loam. The underlying material is silt loam over highly weathered metasedimentary rock.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Glean Variant soils are deep and somewhat excessively drained. Slopes range from 5 to 75 percent. The surface texture is sandy loam. The underlying material is very gravelly fine sandy loam over highly fractured andesite. The soil is 50 to 80 percent rock fragments.

Minor components in this unit include Jumpe family soils which are deep, well drained and rocky. The granitic Cagwin, Cannell, Nanny family, and Toem soils are also minor inclusions.

Areas of this unit are used for timber production and limited summer range. Forage production is limited by competition from conifers and shrubs. Rock outcrop impedes timber harvest.

4. Rock outcrop-Chaix-Chawanakee

Rock outcrop and, moderately deep and shallow, somewhat excessively and well drained soils; on mountainsides and ridges.

This map unit occurs on mountainsides and ridges. Slopes are 5 to 75 percent. Elevation ranges from 2,990 to 9,090 feet and the mean annual precipitation ranges from 14 to 51 inches. Soils in this unit formed in residuum from granitic rock.

The major plant communities in this unit are Yellow Pine Forest, Montane Chaparral, White Fir Forest, and Mixed Conifer Forest.

This unit occupies 30 percent of the survey area. It is about 45 percent Rock outcrop, 25 percent Chaix, and 15 percent Chawanakee. The remaining 15 percent consists of minor components.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Chaix soils are moderately deep and well to somewhat excessively drained. Typically, they have sandy loam surface textures. The underlying material is loam over highly weathered granitic rock.

Chawanakee soils are shallow and somewhat excessively drained. Typically, they have sandy loam surface textures. The underlying material is sandy loam over highly weathered granitic rock. Soils of minor extent include the deep and well drained Holland and Dome, the moderately deep Siskiyou family, the shallow Tollhouse soil and Brader family, and the deep Woolstaf soils derived from metasedimentary rock.

This unit is used for timber production and summer livestock range. Low available water capacity and areas of Rock outcrop limits timber production, and limited by competition from conifers and shrubs.

5. Holland-Hotaw

Deep and moderately deep, well drained soils; on foothills mountainsides, and ridges.

This map unit occurs on foothills, mountainsides, and ridges. Elevation ranges from 3,020 to 7,600 feet and mean annual precipitation ranges from 20 to 51 inches. Soils in this unit formed in residuum from granitic rock.

The major plant communities in this unit are Yellow Pine Forest, White Fir Forest, and Montane Chaparral.

This unit occupies 3 percent of the survey area. It is about 50 percent Holland soils and 15 percent Hotaw. The remaining 35 percent consists of minor components.

Holland soils are deep and well drained. The slopes range from 5 to 75 percent. Typically, they have sandy loam surface textures. The underlying material is clay loam over highly weathered granitic rock.

Hotaw series are moderately deep and well drained. Slopes range from 5 to 50 percent. Typically, the surface texture is sandy loam. The underlying material is sandy clay loam over highly weathered granitic rock.

Minor components include Rock outcrop, the deep and well drained Bohna, Dome, and Shaver soils, the moderately deep Chaix, and the shallow Chawanakee soils.

This unit is used for timber production and summer livestock range. In some area, precipitation limits timber production. Forage production is limited by the competition from conifers and shrubs.

6. Rock outcrop-Tollhouse

Rock outcrop and shallow, somewhat excessively drained soils; on mountainsides and ridges.

This unit occurs on mountainsides and ridges. Elevation ranges from 4,400 to 8,790 feet and the mean annual precipitation from 8 to 24 inches. Soils in this unit formed in residuum from granitic and metamorphic rock.

The major plant communities in this are Pinyon-Juniper Woodland and Sagebrush Scrub.

This unit occupies approximately 8 percent of the survey area. It is about 45 percent Rock outcrop and 45 percent Tollhouse family soils. The remaining 10 percent consists of minor components.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Tollhouse soils are shallow and somewhat excessively drained. Slopes range from 5 to 75 percent. Typically, the soil is coarse sandy loam over highly weathered granitic rock.

Minor components in this map unit are the shallow somewhat excessively drained Cieneba soils, and the moderately deep and well to somewhat excessively drained Chaix soils.

This unit used for summer livestock range. The areas of Rock outcrop, shallow depth of the soils, and low precipitation limit forage production.

7. Woolstalf-Rock outcrop-Wind River family

Deep, well drained soils, and Rock outcrop; on mountainsides and ridges.

This map unit occurs on mountainsides and ridges. Elevation ranges from 4,010 to 8,790 feet and the mean annual precipitation ranges from 10 to 51 inches. Soils in this unit formed predominantly from undifferentiated metamorphic, metasedimentary, and metavolcanic rock.

The major plant communities in this unit are Yellow Pine Forest, Mixed Conifer Forest, Montane Chaparral, and White Fir Forest.

This unit occupies approximately 3 percent of the survey area. It is about 30 percent Woolstalf soils, 20 percent Rock outcrop, and 15 percent Wind River family soils. The remaining 35 percent consists of minor components.

Woolstalf soils are deep and well drained. They occur on slopes of 5 to 75 percent. Typically, the surface texture is gravelly fine sandy loam. The underlying material is gravelly fine sandy loam over weathered metasedimentary rock. The soil is 35 to 75 percent rock fragments.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Wind River family soils are deep and well drained. They occur on slopes of 5 to 50 percent. Typically, the surface is loam. The underlying material is loam, gravelly loam and very gravelly sandy loam over fractured metasedimentary rock.

Minor components in this unit include granitic and non-granitic soils. Boomer soils are deep and well drained formed from metavolcanic rock. Hotaw Variant soils are moderately deep and well drained formed from metamorphic rock. Holland and Dome soils are deep and well drained and formed from granitic rock.

This unit is used for timber production and summer livestock range. Timber productivity is limited by areas of Rock outcrop and rock fragments in the soil. Rock outcrop also impedes harvest. In some areas low precipitation also limits vegetative production. Forage production is limited by competition from conifers and shrubs.

8. Rock outcrop-Cieneba-Auberry

Rock outcrop and shallow and deep, somewhat excessively and well drained soils; on foothills, canyonsides, mountainsides, and ridges.

This map unit occurs on foothill, canyonsides, mountainsides, and ridges. The soils formed in residuum from granitic rock. Elevation ranges from 980 to 7,710 feet and the mean annual precipitation ranges from 8 to 40 inches.

The major plant communities in this unit are foothill Woodland and Mixed Chaparral.

The unit makes up approximately 19 percent of the survey area. It is about 40 percent Rock outcrop, 30 percent Cieneba soils, and 15 percent Auberry soils. The remaining 15 percent consists of minor components.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Cieneba soils are shallow and somewhat excessively drained. Slopes range from 5 to 75 percent. Typically, the highly weathered granitic rock.

Auberry soils are deep and well drained. Slopes range from 10 to 75 percent. Typically, the surface texture is sandy loam. The underlying material is sandy clay loam and clay loam over highly weathered granitic rock.

Minor components include the shallow Chawanakee and Tollhouse soils, and the deep Bohna soils.

This unit is used as spring-summer livestock range. Forage production is limited by low rainfall and areas of Rock outcrop. It is also limited by the competition from hardwoods and shrubs.

9. Rock outcrop-Chualar family-Livermore family

Rock outcrop and moderately deep, well and moderately well drained soil; on foothills, mountainsides, and ridges.

This map unit occurs on foothills, canyonsides, mountainsides and ridges. The soils formed in residuum from undifferentiated metamorphic, metasedimentary, and basic igneous rock. Elevation ranges from 1,210 to 7,020 feet and the mean annual precipitation ranges from 8 to 30 inches.

The major plant communities in this unit are Mixed Chaparral, Piute Cypress Woodland, Pinyon-Juniper Woodland, and Foothill Woodland.

The unit makes up approximately 5 percent of the survey area. It is about 35 percent Rock outcrop, 30 percent Chualar family soils, and 15 percent Livermore family soils. The remaining 20 percent consists of minor components.

Rock outcrop occurs as small isolated outcroppings and as massive exposures.

Chualar family soils are moderately deep and well drained. Slopes range from 15 to 75 percent. Typically the surface texture is loam. The underlying material is clay loam over weathered basic igneous rock.

Livermore family soils are moderately deep and moderately well drained. Slopes range from 30 to 75 percent. Typically the surface texture is cobbly and stoney sandy loam. The underlying material is very gravelly sandy loam over weathered metasedimentary rock. The soil is 35 to 90 percent rock fragments.

Minor components include shallow and somewhat excessively drained Cieneba and Tollhouse soils.

Minor components include shallow and somewhat excessively drained Cieneba and Tollhouse soils.

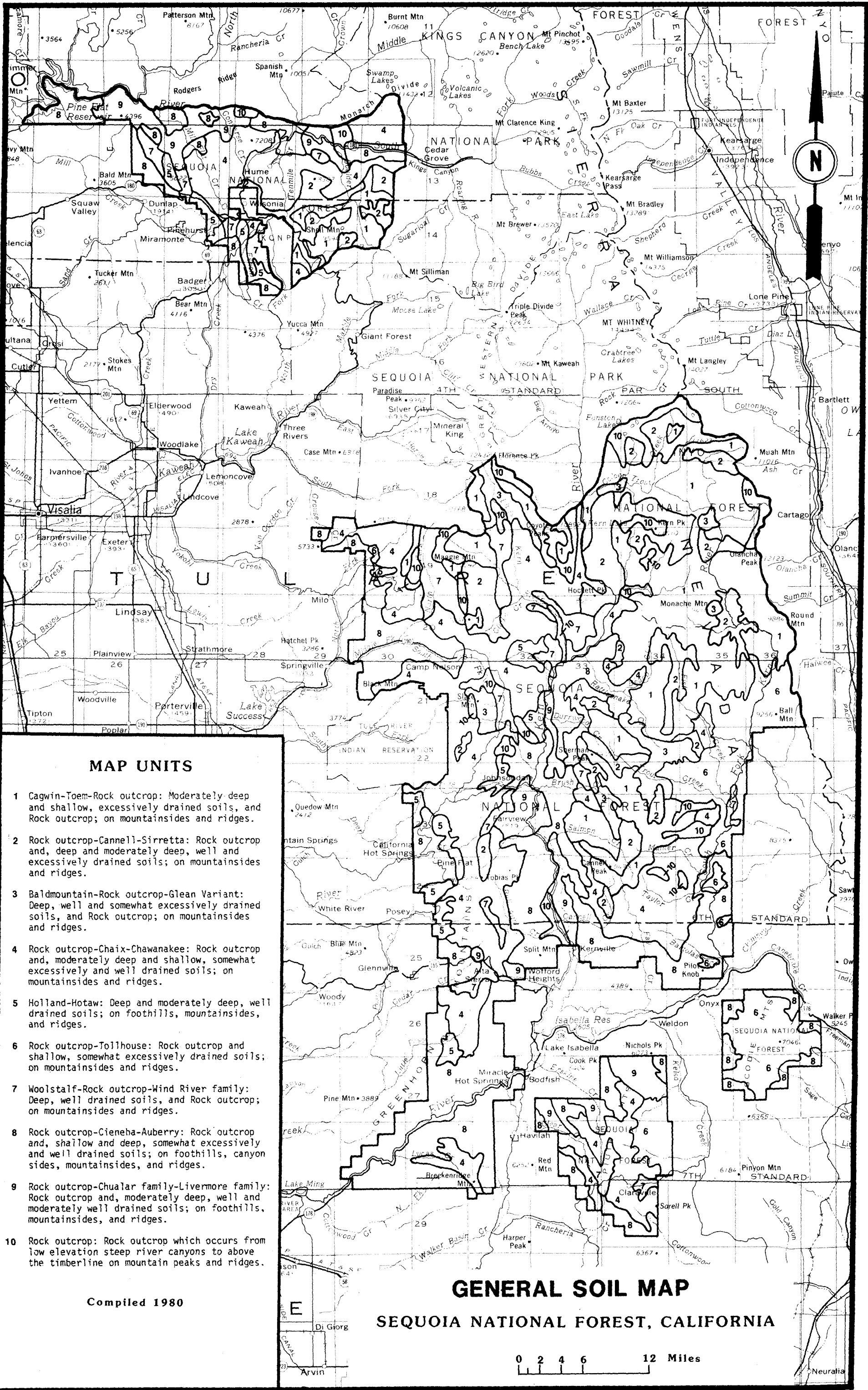
This unit is used as spring-summer livestock range. Forage production is limited by low rainfall and areas of Rock outcrop. It is also limited by the competition from hardwoods and shrubs.

10. Rock outcrop

This map unit occurs from the low elevation steep rivers canyons to above the timberline on mountain peaks and ridges.

This unit makes up approximately 11 percent of the survey area. It is about 85 percent rock outcrop. The remaining 15 percent is made up by shallow soils.

Rock outcrop consists of granitic, basic igneous, undifferentiated metamorphic, metasedimentary and metavolcanic rock types.



MAP UNITS

- 1 Cagwin-Toem-Rock outcrop: Moderately deep and shallow, excessively drained soils, and Rock outcrop; on mountainsides and ridges.
- 2 Rock outcrop-Cannell-Sirretta: Rock outcrop and, deep and moderately deep, well and excessively drained soils; on mountainsides and ridges.
- 3 Baldmountain-Rock outcrop-Glean Variant: Deep, well and somewhat excessively drained soils, and Rock outcrop; on mountainsides and ridges.
- 4 Rock outcrop-Chaix-Chawanakee: Rock outcrop and, moderately deep and shallow, somewhat excessively and well drained soils; on mountainsides and ridges.
- 5 Holland-Hotaw: Deep and moderately deep, well drained soils; on foothills, mountainsides, and ridges.
- 6 Rock outcrop-Tollhouse: Rock outcrop and shallow, somewhat excessively drained soils; on mountainsides and ridges.
- 7 Woolstalf-Rock outcrop-Wind River family: Deep, well drained soils, and Rock outcrop; on mountainsides and ridges.
- 8 Rock outcrop-Cieneba-Auberry: Rock outcrop and, shallow and deep, somewhat excessively and well drained soils; on foothills, canyon sides, mountainsides, and ridges.
- 9 Rock outcrop-Chualar family-Livermore family: Rock outcrop and, moderately deep, well and moderately well drained soils; on foothills, mountainsides, and ridges.
- 10 Rock outcrop: Rock outcrop which occurs from low elevation steep river canyons to above the timberline on mountain peaks and ridges.

Compiled 1980

GENERAL SOIL MAP SEQUOIA NATIONAL FOREST, CALIFORNIA

0 2 4 6 12 Miles

Detailed Soil Map Units

The map unit symbols on the soils maps are described in this section. The map unit descriptions, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They can also be used to plan the management needed for those areas.

Each map unit on the soil maps represents an area on the landscape and consists of one or more soils for which the unit is named. The symbol from the soil map precedes the map unit name. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are similar make up a soil family, such as Wind River family soil. Except for differences in texture of the surface layer or of the underlying material, all soils of a family have major horizons that are similar in composition, thickness, and arrangement.

Other soils, such as Typic Haploxerolls, have many more differences than soil families. These soils, however, have some similar properties which group them together so that their use can be predicted. These soils were grouped more broad than soil families because they were either highly variable, did not take up much area, or there was too little information known about them. Therefore, the interpretations given for these soils should be taken in a broader sense than soil families.

This survey includes miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Miscellaneous areas are described in the map units.

Many map units are made up of two or three soils and/or miscellaneous areas. These map units are called complexes or associations.

A complex consists of two or more soils and/or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Chaix-Dome- Rock outcrop complex, 30 to 50 percent slopes is an example.

An association is made up of two or more geographically associated soils and/or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils are somewhat similar. Shaver-Holland association, moderately steep is an example.

Each map unit includes small scattered areas of soils and miscellaneous areas other than those for which the map unit is named. Some of these soils and miscellaneous areas differ substantially from the major soils and miscellaneous areas. Such differences could significantly affect use and management in the map unit. The included soils and miscellaneous areas are identified in each map unit description.

Definitions and Criteria

Map Units. The map unit symbol corresponds to the same symbol in the delineations on the maps in the back of the report. The map unit name then follows and it includes the name of the soils and miscellaneous area in the map unit, and the slope range of the unit.

Elevation. The range of elevation (in feet) for the map unit.

Annual Precipitation. A range of average annual precipitation (in inches) for the map unit.

Map Unit Components. The name of the dominant soils and miscellaneous area which make up the map unit. Each soil component is described separately under Taxonomic Unit Descriptions.

Approximate Proportion. The approximate proportion of the component in the map unit.

Landscape Position. The name of the landforms on which the component occurs.

Slope. The range of slope for the component.

Native Plant Community. These are the typical plant communities that commonly occur in this map unit.

Soil Profile Description. This is a brief description of the typical, or modal, profile of the soil component. In most instances it is a condensed version of the detailed soil description in the back of the report. This general description combines horizons and includes the thickness, dry color, texture, structure, dry consistence, rock fragment content, and reaction (pH). Miscellaneous areas are also described here.

Surface Layer. The A horizons at or near the surface in which organic matter is mixed with mineral material.

Subsoil. The soil between the surface soil and the uppermost substratum. All parts of B horizons above two meters (80 inches), and any parts of A or

C horizons between the surface soil and one meter (40 inches) or a more shallow substratum, are subsoil.

Substratum. A layer below one meter (40 inches), or beneath the solum if the lower part of the solum is between one and two meters (40 to 80 inches) deep. Any parts of the solum below two meters (80 inches) are substrata. Bedrock, hardpan, and unconsolidated geologic materials that are in contrasting particle-size classes relative to the surface soil or solum are substrata regardless of depth, even within one meter (40 inches) of the ground surface. However, the surface soil and solum together must be at least 10 cm (4 inches) thick for the regolith to be considered soil. A common example of contrasting unconsolidated deposits on alluvial plains is extremely gravelly sand overlain with loam or silt loam. Roots are generally sparse or absent in substrata.

Included Areas. These are areas of soil components or miscellaneous areas that are not identified in the name of the map unit. These areas usually make up a small percentage of the map unit acreage and are not delineated separately because their effect on management is not significantly different, they are too small to be delineated at the scale of mapping, excessive detail of the map would be avoided by including them, or their location cannot be identified practically. Included areas are given because some do effect management significantly and the recognition of all of them will assist with more detailed mapping in the future.

Soil Properties and Management Interpretations

Map Unit Components. These are the soil type(s) and/or miscellaneous area(s) which make up the map unit. Each soil component is then individually interpreted. The interpretations are not applicable on the miscellaneous areas alone, however, the miscellaneous area may have an effect on the rating of the soil component.

Effective Rooting Depth (Inches). The vertical distance, in inches, from the soil surface to bedrock or any other layer that stops or hinders the penetration of roots.

Drainage. This refers to the rate at which water is removed from the soil, the period of wetness, and any possible affect on the growth of plants. It is determined by soil texture, soil structure, rock fragment content, restricting soil layers, depth of bedrock, and height of the water table. The classes recognized in the survey area are:

Excessively Drained - Water is removed from the soil rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat Excessively Drained - Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well Drained - Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately Well Drained - Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat Poorly Drained - Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching stream channels is called ground-water runoff or seepage flow from ground water.

Permeability. The quality of the soil that enables water to move downward through the profile. The rating here is based on the least pervious horizon. The principal factor in controlling the movement of water through the soil is its porosity. Soil porosity is controlled by texture, structure, animal activity, old root channels, and rock fragments. Porosity can be decreased by management activities when these activities cause the soil to compact. Permeability is measured as the number of inches per hour that water moves downward through the

saturated soil. Terms describing the estimated permeability are:

| | |
|------------------|------------------------|
| Very slow | less than 0.06 inch |
| Slow | 0.06 to 0.20 inch |
| Moderately slow | 0.2 to 0.6 inch |
| Moderate | 0.6 inch to 2.0 inches |
| Moderately rapid | 2.0 to 6.0 inches |
| Rapid | 6.0 to 20 inches |
| Very rapid | more than 20 inches |

Available Water Capacity (Inches). This is the capacity of soils to hold water available for use by most plants. This capacity primarily depends on the soil texture, depth, and rock fragment content. Generally, the more clay which is in the soil the more water it can hold. Conversely, the more rock fragments in the soil the less water is held. Available Water Capacity (AWC) is an important factor in the prediction of conifer seedling survival. It is not the only factor and it is not an estimate of the quantity of water actually available to plants at any given time. AWC is expressed as inches of water in a specified number of inches of soil. This guide (10) is based on soil texture. This amount was reduced if rock fragments were present (3). Two depths are estimated:

Upper 20 Inches. AWC is estimated for the top 20 inches of soil as a guide to evaluating the revegetation potential of the soil for planted conifer seedling stock. As a guide, these class limits may be used to categorize the AWC estimate:

| | |
|--------|----------------------|
| Low | Less than 1.2 inches |
| Medium | 1.2 to 2.4 inches |
| High | More than 2.4 inches |

Total. This is the AWC calculated for the whole soil to a maximum depth of 60 inches. The class limits given to this AWC estimate are:

| | |
|--------|----------------------|
| Low | Less than 3.6 inches |
| Medium | 3.6 to 7.2 inches |
| High | Over 7.2 inches |

Hydrologic Soil Group. The Hydrologic Soil Group (HSG) rates the soils according to their ability to accept and transmit water down through the profile. The HSG may be used in conjunction with other factors such as slope and vegetation to estimate the potential surface runoff. The factors used in the rating are infiltration, permeability, and depth at which permeability reduction begins. The methodology of rating the soils was developed by the Soil Conservation Service, USDA. Hydrologists are the most common user of the Hydrologic Soil Group. The four groups are:

Group A - Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to excessively drained sands and/or gravel. These soils have a high rate of water transmission and normally result in a low runoff potential.

Group B - Soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well drained soils, with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C - Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer that impedes the downward movement of water, or (2) soils with moderately fine to fine textures and a slow infiltration rate. These soils have a slow rate of water transmission.

Group D - Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of shallow soils over nearly impervious materials. These soils have a very slow rate of water transmission and usually a high runoff potential.

Unified Soil Classification. Unified soil classification is determined according to the Unified soil classification system. This system classifies soil according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. **Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC;** silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. The classification is based on the soil profile description in the map unit. Soils exhibiting engineering properties of two groups can have a dual classification, for example SW-SM. If the classification changes in the soil profile, such as the surface layer is SM and the subsoil is SC, this would be indicated by a "/", for example SM/SC.

Erosion Factor K. This is one of six factors used by soil scientists in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Factor K is an indicator of the susceptibility of a soil to erode, but should only be used in the USLE equation. The estimates are based primarily on the percentage of silt, sand and organic matter, the soil structure, and permeability of the soil layer being estimated. These estimates were arrived at by using a nomograph (11) and the actual number of a known similar soil.

Maximum Erosion Hazard

Many land use activities have the potential to cause erosion rates to exceed natural soil erosion or soil formation rates. Potential consequences of accelerated erosion include reductions in the productive capacity of the soil and adverse effects on water quality. Many interrelated factors are evaluated in an EHR system to determine whether land use activities would cause accelerated erosion, and to what degree accelerated erosion would cause adverse effects. It is designed to appraise the relative risk of accelerated sheet and rill erosion. The system does not rate gully erosion, dry ravel, wind erosion, or mass wasting.

The adjective erosion hazard ratings are described below in terms of the likelihood and consequences of accelerated erosion. As the risk of accelerated erosion increases, so does the likelihood that accelerated erosion will exceed soil formation rates. The risk and consequence becomes especially critical for shallow and moderately deep soils over consolidated materials.

The maximum EHR are based on little or no vegetative cover present and on the long-term average occurrence of 2-year, 6-hour storm events. Erosion hazard risks are greater when storm frequency, intensity and/or duration exceed long-term average occurrence, and risks are less when occurrence is below "average". The risks and consequences for adjective erosion hazard ratings are described below.

Low EHR. Accelerated erosion is not likely to occur, except in the upper part of the Low EHR numerical range, or during periods of above average storm occurrence. If accelerated erosion does occur, adverse effects on soil productivity and to nearby water quality are not expected. Erosion control measures are usually not needed for these areas.

Moderate EHR. Accelerated erosion is likely to occur in most years. Adverse effects on soil productivity (especially to shallow and moderately deep soils) and to nearby water quality may occur for the upper part of the Moderate EHR numerical range, or during periods of above average storm occurrence. The need for erosion control should be evaluated for these areas. A wide selection of measures and application methods are available.

High EHR. Accelerated erosion will occur in most years. Adverse effects on soil productivity (especially to shallow and moderately deep soils) and to nearby water quality are likely to occur, especially during periods of above average storm occurrence. Erosion control is necessary for these areas to prevent accelerated erosion. The

selection of measures and methods of application are somewhat limited.

Very high EHR. Accelerated erosion will occur in most years. Adverse effects on soil productivity and to nearby water quality are very likely to occur, even during periods of below average storm occurrence. Erosion control is essential for these areas to prevent accelerated erosion. The selection of measures and methods of application are limited.

Soil Manageability. Certain features of the land affect the relative ease of management with mechanized equipment. Soil manageability classification rates soils on the basis of their topography and other features that reduce the ease of equipment operation and increase the need for soil protection measures.

Soil Manageability Classes. *Soil manageability classes are ratings that are applied to the individual components of a map unit.* If a soil component is in complex or association with Rock outcrop, however, the class rating for that soil is based on the amount of Rock outcrop in the map unit. Manageability classes are useful for supplying specific information about individual soils. Letter symbols are used to indicate the type and severity of potential problems in soil management. Major limitations to land management are identified by capital letters, and moderate limitations are indicated by lower-case letters. The criteria and symbols for each limiting feature are listed below except slope. In a soil rating, the limitations are listed in the order shown, except that major limitations take precedence over moderate ones.

There are four soil manageability classes, based on slope and the other limiting features presented above. They are:

Class 1 - Easy to manage. Soils in this class have less than 35 percent slope. They have no major limitations and no more than one moderate limitation.

Class 2 - Readily manageable. Soils in this class are on slopes of less than 35 percent, but they have at least two moderate limitations or one major limitation.

Class 3 - Moderately difficult to manage. Soils in this class are on slopes of 35 to 65 percent. Symbols are added to denote any moderate or major limitations.

Class 4 - Very difficult to manage. Soils in this class are on slopes of more than 65 percent. Symbols are added to denote any moderate or major limitations.

TABLE 1. - Soil Features Affecting Management

| Soil features | Major modifiers | Moderate modifiers |
|----------------------------------|------------------------------------|-------------------------------------|
| Slope gradient | G..Mostly more than 60 percent | g..Mostly between 30 and 60 percent |
| Maximum erosion hazard | E..High or very high | e..Moderate |
| Soil depth | D..Less than 10 inches | d..10 to 20 inches |
| AWC, upper 20 inches | P..Less than 1.2 inches | p..1.2 to 2.4 inches |
| Wetness | W..Poorly drained | w..Somewhat poorly drained |
| Rock outcrop or surface boulders | X..More than 15 percent of surface | x..3 to 15 percent of surface area |

Soil Manageability Groups. *Soil manageability groups are ratings for entire map units* for the ease of management based upon the soil manageability classes of the individual soil components in the map unit. They can be used by land managers who deal with large areas and are not concerned with the ratings for the individual soil components. Soil manageability groups are designated by Roman numerals to distinguish them from soil manageability classes. The groups are:

Group I - Map units in this group are comprised primarily of Class 1 components with less than 30 percent Class 2, and less than 20 percent Class 3 and 4 components.

Group II - Map units in this group are comprised primarily of Class 2 components with less than 40 percent Class 3, and less than 15 percent Class 4 components.

Group III - Map units in this group are comprised primarily of Class 3 components with less than 40 percent Class 4 components.

Group IV - Map units in this group are comprised of at least 40 percent Class 4 components.

Range Production

The suitability for range is indicated by "spring-summer, summer, and unsuitable." A rating of "spring-summer" means that the soils are capable of producing annual grasses for grazing in the spring through early summer. A rating of "summer" means that the soils are capable of producing perennial grassed, sedges, and rushes for grazing in the summer. A rating of "unsuitable" means that the unit is not capable of producing forage.

The "most limiting factors" for use as range are listed for the units suited to spring-summer range and summer range.

If the unit is suited to spring-summer range, "Rock outcrop" indicates the percent of non-productive land and "shallow soils" indicates the percent of soils that are less than 20 inches deep.

If the unit is suitable for summer range, "plant competition" indicates that forage generally has to compete with trees and shrubs for sunlight, water, and soil nutrients; "steep slopes" indicates that the unit has slopes of 30 to 50 percent; "very steep slopes" indicates that

the unit has slopes of more than 50 percent; "Rock outcrop" indicates that the unit is 25 percent Rock outcrop or more; and "shallow soils" indicates that the unit is 25 percent soils that are less than 20 inches deep.

Timber Production

Timber productivity is assessed by listing the estimated culmination of mean annual increment (CMAI) for the major map unit component capable of timber production. The productivity of other components of the unit may be dissimilar. Productivity is not listed for incapable or unsuitable units. The suitability for timber production is indicated by incapable, unsuitable, poorly suited, and suitable. Units listed as incapable for timber production have a biological growth potential of less than 20 cubic feet per acre per year. Suitability is an assessment of the ability of capable lands to be adequately restocked within 5 years after harvest. There is a reasonable assurance that units listed as suitable can be restocked, and that units listed as unsuitable cannot be restocked. It will be difficult, but possible, to assure ad-

equately restocking within 5 years in units listed as poorly suited.

The factor of "regeneration difficulty" indicates that the unit has two or more restrictive characteristics or qualities. These are designated by the letter a, b, c, d, e, or r. The letter "a" indicates that one of the major soils in the map unit is less than 20 inches deep, which limits the volume of soil available for root development. The letter "b" indicates that the soil temperatures are cold, which reduces the growing season and retards the growth rate of introduced pine species. The letter "c" indicates that the soil is too hot and dry for timber production. The letter "d" indicates that the available water capacity of the soil is low, which reduces seedling survival and growth. The letter "e" indicates that the soils are more than 20 percent rock fragments, which reduces rooting depth and increases difficulty of planting. The letter "f" indicates that more than 20 percent of the map unit is Chaix or Siskiyou family soils, which have restricted depth and low available water capacity.

105 Auberry sandy loam, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on mountainsides and canyonsides. It formed in residuum derived from granitic rock. The native plant community is Mixed Chaparral. Elevation is 1,600 to 3,280 feet. The average annual precipitation is about 30 to 40 inches.

Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 27 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

Soil Map Unit Components

Auberry

Depth 40 to 60+ in

Available Water Capacity Moderate
Total 5 to 8 in
Upper 20" 3 in

Permeability Moderately slow

Hydrologic Soil Group B

Drainage Class Well drained

Runoff Rapid

Max Erosion Hazard High

Erosion Factor (K) 0.20

Unified Soil Class SM/SC

Soil & Rock Color Intermediate

Soil Manageability Class 3G

Timber Production
CMAI (cu ft/acre) —

Suitability Incapable
Limiting Factors

Range Production
Seasons of Use Spring and summer
Limiting Factors rock outcrop, shallow soils, very steep slopes

Soil Manageability Group IV

Included Areas & Remarks Included in this unit are small areas of Cienega soils and Rock outcrop. Included areas make up about 20 percent of the total acreage.

This unit is suitable for use as rangeland in spring and summer.

106 Bohna loam, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on foothills. It formed in residuum derived from granitic rock. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 4,100 to 5,410 feet. The average annual precipitation is about 18 to 20 inches.

Typically, the surface layer is brown loam about 19 inches thick. The subsoil is strong brown sandy clay loam about 24 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Soil Map Unit Components

Bohna Loam

Depth

40 to 60 in

Available Water Capacity

High

Total

7 to 10 in

Upper 20"

3 in

Permeability

Moderately slow

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Medium

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.28

Unified Soil Class

ML-CL/CL

Soil & Rock Color

Intermediate

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils and Rock outcrop. Included areas make up about 15 percent of the total acreage.

This unit is suitable for use as rangeland in spring and summer.

107 Bohna loam, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on mountainsides. It formed in residuum derived from granitic rock. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 2,300 to 5,410 feet. The average annual precipitation is about 24 to 39 inches.

Typically, the surface layer is brown loam about 19 inches thick. The subsoil is strong brown sandy clay loam about 24 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Soil Map Unit Components

Bohna Loam

Depth

40 to 60 in

Available Water Capacity

Moderate to high

Total

7 to 10 in

Upper 20"

3 in

Permeability

Moderately slow

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Medium

Max Erosion Hazard

High

Erosion Factor (K)

0.28

Unified Soil Class

ML-CL/CL

Soil & Rock Color

Intermediate

Soil Manageability Class

3E

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils

Soil Manageability Group

III

Included Areas & Remarks

Included in this unit are small areas of Cienega soils and Rock outcrop. Included areas make up about 20 percent of the total acreage.

This unit is used as rangeland in spring and summer.

112 Auberry-Holland* association, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on the sides of foothills and mountains. It is in a transitional area; soil temperature ranges from warm to cool. Slope is 10 to 30 percent. The native plant communities range from Mixed Chaparral and Foothill Woodland to Montane Chaparral and Yellow Pine Forest. Elevation is 3,200 to 5,500 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 60 percent Auberry sandy loam and 20 percent Holland sandy loam.

Soil Map Unit Components

Auberry

Holland*

Depth

40 to 60+ in

60+ in

Available Water Capacity Total Upper 20"

Moderate
5 to 8 in
3 in

Moderate to high
7 to 10 in
3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid or medium

Rapid or medium

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM-SC

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2e

3E

Timber Production

CMAI (cu ft/acre)

—

50 to 84*

Suitability

Incapable

Poorly suited

Limiting Factors

regeneration difficulty—c and d, high erosion hazard

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Auberry soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Holland soil is cool, deep, and well drained. It formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granite. In some areas the surface layer is loam.

This unit is used mainly as rangeland in spring and summer. It is also used for limited timber production.

* Footnote: Timber production value lower than typical for the Holland series in Sequoia National forest.

114 Auberry-Holland* association, 50 to 75 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on foothills and mountainsides. It is in a transitional area; soil temperature ranges from warm to cool. Slope is 50 to 75 percent. The native plant communities range from Mixed Chaparral and Foothill Woodland to Montane Chaparral and Yellow Pine Forest. Elevation is 3,200 to 5,500 feet. The average annual precipitation is about 24 to 54 inches.

This unit is 50 percent Auberry sandy loam and 40 percent Holland sandy loam.

Soil Map Unit
Components

Auberry

Holland*

Depth

40 to 60+ in

60+ in

Available Water Capacity
Total
Upper 20"

Moderate
5 to 8 in
3 in

Moderate
7 to 9 in
3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM-SC

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3G

3G

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

—
Incapable
regeneration difficulty—c and d, very steep slopes, high erosion hazard

50 to 84*
Poorly suited

Range Production
Seasons of Use
Limiting Factors

Spring and summer
rock outcrop, shallow soils, very steep slopes

Spring and summer

Soil Manageability
Group

IV

IV

Included Areas &
Remarks

Included in this unit are small areas of Cieneba soils and Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Auberry soil is formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Holland soil is cool, deep, and well drained. It formed in residuum derived dominantly from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

This unit is used mainly as rangeland in spring and summer. It is also used for limited timber production.

* Footnote: Timber production value lower than typical for the Holland series in Sequoia National forest.

116 Kanaka-Millerton families-Rock outcrop association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills and mountainsides. Slope is 30 to 50 percent. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 1,610 to 4,000 feet. The average annual precipitation is about 24 to 30 inches.

This unit is 40 percent Kanaka family gravelly sandy loam, 30 percent Millerton family gravelly sandy loam, and 20 percent Rock outcrop.

Soil Map Unit Components

Kanaka family

Millerton family

Rock outcrop

Depth

20 to 40 in

8 to 20 in

Available Water Capacity

Low to very low

Very low

Total

1 to 3 in

1 to 2 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

D

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.32

0.49

Unified Soil Class

SM

SM/SC

Soil & Rock Color

Intermediate

High

Soil Manageability Class

3ep

3Edp

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

rock outcrop, shallow soils, high erosion hazard

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of shallow soils. Included areas make up about 10 percent of the total acreage.

The Kanaka family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is pale brown and brown gravelly sandy loam about 9 inches thick. The subsoil is yellowish brown gravelly sandy loam about 9 inches thick. The substratum is light yellowish brown gravelly coarse sandy loam about 8 inches thick over highly weathered granitic rock.

The Millerton family soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown and light yellowish brown gravelly sandy loam about 6 inches thick. The subsoil is brown gravelly sandy loam and sandy clay loam about 8 inches thick over granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

119 Rock outcrop-Auberry-Kanaka family association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, canyonsides, and mountainsides. Slope is 30 to 50 percent. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 2,400 to 4,360 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 50 percent Rock outcrop, 35 percent Auberry sandy loam, and 15 percent Kanaka family gravelly sandy loam.

Soil Map Unit Components

Rock outcrop

Auberry

Kanaka family

Depth

60+ in

20 to 40 in

Available Water Capacity Total Upper 20"

Moderate

Low to very low

5 to 8 in

1 to 3 in

3 in

2 in

Permeability

Moderately slow

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3e

3ep

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

—

—

Incapable

Incapable

Range Production Seasons of Use Limiting Factors

Spring and summer

Spring and summer

rock outcrop

Soil Manageability Group

III

III

Included Areas & Remarks

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Auberry soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Kanaka family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is pale brown and brown gravelly sandy loam about 9 inches thick. The subsoil is yellowish brown gravelly sandy loam about 9 inches thick. The substratum is light yellowish brown gravelly coarse sandy loam about 8 inches thick over highly weathered granitic rock.

This unit is used as rangeland in spring and summer.

120 Rock outcrop-Auberry-Kanaka family association, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, canyonsides, and mountainsides. Slope is 50 to 75 percent. The native plant communities are mainly Foothill Woodland and Mixed Chaparral. Elevation is 2,400 to 4,430 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 50 percent Rock outcrop, 25 percent Auberry sandy loam, and 25 percent Kanaka family gravelly sandy loam.

Soil Map Unit Components

Rock outcrop

Auberry

Kanaka family

Depth

60+ in

20 to 40 in

Available Water Capacity

Moderate

Low to very low

Total

5 to 8 in

1 to 3 in

Upper 20"

3 in

2 in

Permeability

Moderately slow

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3G

3Gp

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

rock outcrop, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Auberry soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Kanaka family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is pale brown and brown gravelly sandy loam about 9 inches thick. The subsoil is yellowish brown and brown gravelly sandy loam about 9 inches thick. The substratum is light yellowish brown gravelly coarse sandy loam about 8 inches thick over highly weathered granitic rock.

This unit is used as rangeland in spring and summer.

122 Kanaka family-Chawanakee Variant-Rock outcrop association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 30 to 50 percent. The native plant communities are Mixed Chaparral and Foothill Woodland. Elevation is 3,490 to 5,000 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 50 percent Kanaka family gravelly sandy loam, 30 percent Chawanakee Variant sandy loam, and 20 percent Rock outcrop.

Soil Map Unit Components

Kanaka family

Chawanakee variant

Rock Outcrop

Depth

20 to 40 in

8 to 20 in

Available Water Capacity

Low to very low

Low to very low

Total

1 to 3 in

2 to 3 in

Upper 20"

2 in

3 in

Permeability

Moderately rapid

Moderate

Hydrologic Soil Group

C

D

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.32

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ep

3Edx

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer
rock outcrop, shallow soils

Spring and summer

Limiting Factors

Soil Manageability Group

III

III

Included Areas & Remarks

The Kanaka family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is pale brown and brown gravelly sandy loam about 9 inches thick. The subsoil is yellowish brown gravelly sandy loam about 9 inches thick. The substratum is light yellowish brown gravelly coarse sandy loam about 8 inches thick over highly weathered granitic rock.

The Chawanakee Variant soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is yellowish brown and light yellowish brown sandy loam about 7 inches thick. The subsoil is yellowish brown and light yellowish brown sandy loam about 11 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

123 Kanaka family-Chawanakee Variant-Rock outcrop association, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 50 to 75 percent. The native plant communities are Mixed Chaparral and Foothill Woodland. Elevation is 2,400 to 5,000 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 40 percent Kanaka family gravelly sandy loam, 30 percent Chawanakee Variant sandy loam, and 30 percent Rock outcrop.

Soil Map Unit Components

Kanaka family Chawanakee variant Rock Outcrop

Depth

20 to 40 in

8 to 20 in

Available Water Capacity

Low to very low

Low to very low

Total

1 to 3 in

2 to 3 in

Upper 20"

2 in

3 in

Permeability

Moderately rapid

Moderate

Hydrologic Soil Group

C

D

Drainage Class

Well drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.32

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

rock outcrop, shallow soils, very steep slopes,

Soil Manageability Group

IV

IV

Included Areas & Remarks

The Kanaka family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is pale brown and brown gravelly sandy loam about 9 inches thick. The subsoil is yellowish brown gravelly sandy loam about 9 inches thick. The substratum is light yellowish brown gravelly coarse sandy loam about 8 inches thick over highly weathered granitic rock.

The Chawanakee Variant soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is yellowish brown and light yellowish brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 11 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

125 Tollhouse Variant-Shaver Variant-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. The native plant communities are Mixed Chaparral and Foothill Woodland. Elevation is 2,400 to 4,400 feet. The average annual precipitation is about 30 to 35 inches.

This unit is 40 percent Tollhouse Variant sandy loam, 20 percent Shaver Variant sandy loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Tollhouse variant Shaver variant Rock outcrop

Depth

7 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 5 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

D

C

Drainage Class

Somewhat excessively drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.32

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ed

3Ep

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

rock outcrop, shallow soils, high erosion hazard

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of gullied land, Auberry soils, Cienega soils, and Tollhouse soils. Included areas make up about 20 percent of the total acreage.

The Tollhouse Variant soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 11 inches thick. The substratum is brown sandy loam about 5 inches thick over highly weathered granitic rock.

The Shaver Variant soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is yellowish brown sandy loam about 15 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

201 Cieneba-Rock outcrop complex, 15 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on foothills, mountainsides, and ridges. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 2,200 to 6,500 feet. The average annual precipitation is about 18 inches.

This unit is 65 percent Cieneba coarse sandy loam and 25 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Cieneba

Rock outcrop

Depth

4 to 20 in

Available Water Capacity

Low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

C

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability
Class

4EPdx

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils, high erosion hazard

Soil Manageability
Group

IV

Included Areas &
Remarks

Included in this unit are small areas of Tollhouse soils and Chualar family soils. Included areas make up about 10 percent of the total acreage.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

202 Cieneba-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 980 to 6,560 feet. The average annual precipitation is about 28 inches.

This unit is 65 percent Cieneba coarse sandy loam and 25 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Cieneba

Rock outcrop

Depth

4 to 20 in

Available Water Capacity

Low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

C

Drainage Class

Somewhat excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

4GPdx

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils, very steep slopes, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Tollhouse soils and Chualar family soils. Included areas make up about 10 percent of the total acreage.

The Cieneba soil is shallow and formed in residuum derived dominantly from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

203 Chualar family-Rock outcrop complex, 15 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Mixed Chaparral, Piute Cypress Woodland, and Pinyon-Juniper Woodland. Elevation is 2,800 to 5,810 feet. The average annual precipitation is about 12 to 30 inches.

This unit is 70 percent Chualar family loam and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chualar family

Rock outcrop

Depth

20 to 40 in

Available Water Capacity

Low to moderate

Total

4 to 6 in

Upper 20"

3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.32

Unified Soil Class

ML/CL

Soil & Rock Color

Intermediate

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils and Xerofluvents. Included areas make up about 10 percent of the total acreage.

The Chualar family soil is moderately deep and formed in residuum derived from metamorphic, metasedimentary, or basic igneous rock. Typically, the surface layer is dark brown loam about 9 inches thick. The subsoil is brown and yellowish brown clay loam about 20 inches thick over weathered basic igneous rock. In some areas the surface layer is fine sandy loam, sandy loam, or sandy clay loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of rock.

This unit is used as rangeland in spring and summer.

205 Chualar family-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Mixed Chaparral and Pinyon-Juniper Woodland. Elevation is 1,210 to 6,500 feet. The average annual precipitation is about 10 to 30 inches.

This unit is 50 percent Chualar family loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chualar family

Rock outcrop

Depth

20 to 40 in

Available Water Capacity

Low to moderate

Total

4 to 6 in

Upper 20"

3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

ML/CL

Soil & Rock Color

Intermediate

Soil Manageability Class

3EX

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils, very steep slopes, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils and Xerofluvents. Included areas make up about 20 percent of the total acreage.

The Chualar family soil is moderately deep and formed in residuum derived from metamorphic, metasedimentary, or basic igneous rock. Typically, the surface layer is dark brown loam about 9 inches thick. The subsoil is brown and yellowish brown clay loam about 20 inches thick over weathered basic igneous rock. In some areas the surface layer is fine sandy loam, sandy loam, or sandy clay loam.

Rock outcrop occurs as isolated outcroppings and massive exposures.

This unit is used as rangeland in spring and summer.

212 Auberry-Cieneba-Rock outcrop complex, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This unit is on foothills, canyonsides, and mountainsides. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 3,610 to 5,580 feet. The average annual precipitation is about 18 to 30 inches.

This unit is 55 percent Auberry sandy loam, 15 percent Cieneba coarse sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Auberry

Cieneba

Rock Outcrop

Depth Available Water Capacity Total Upper 20"

40 to 60+ in

4 to 20 in

Permeability

Moderately slow

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained

Somewhat excessively
drained

Runoff

Medium

Rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ex

2Pex

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

—

—

Incapable

Incapable

Range Production Seasons of Use Limiting Factors

Spring and summer
rock outcrop, shallow soils

Spring and summer

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Chawanakee soils, Chaix soils, and Wind River family soils. Included areas make up about 15 percent of the total acreage.

The Auberry soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as rangeland in spring and summer.

213 Auberry-Cieneba-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on canyonsides and mountainsides. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 980 to 6,560 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 45 percent Auberry sandy loam, 25 percent Cieneba coarse sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Auberry

Cieneba

Rock Outcrop

Depth

40 to 60+ in

4 to 20 in

Available Water Capacity

Moderate

Low

Total

5 to 8 in

1 to 2 in

Upper 20"

3 in

1 in

Permeability

Moderately slow

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained

Somewhat excessively
drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.20

0.32

Unified Soil Class

SM/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2e

3Epd

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

rock outcrop, shallow soils, high erosion hazard

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Chawanakee soils, Chaix soils, and Wind River family soils. Included areas make up about 15 percent of the total acreage.

The Auberry soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock.

The Cieneba soil is shallow and formed in residuum derived dominantly from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as limited rangeland in spring and summer.

219 Chesaw-Nanny families association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. Slope is 30 to 50 percent. The native plant communities are open stands of Yellow Pine Forest and Pinyon-Juniper Woodland with an understory of Sagebrush Scrub. Elevation is 7,610 to 9,200 feet. The average annual precipitation is about 14 to 20 inches.

This unit is 65 percent Chesaw family extremely cobbly loamy coarse sand and 25 percent Nanny family stony sandy loam.

Soil Map Unit Components

Chesaw family

Nanny family

Depth
Available Water Capacity
Total
Upper 20"
Permeability
Hydrologic Soil Group
Drainage Class
Runoff
Max Erosion Hazard
Erosion Factor (K)
Unified Soil Class
Soil & Rock Color
Soil Manageability
Class
Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors
Range Production
Seasons of Use
Limiting Factors
Soil Manageability
Group
Included Areas &
Remarks

20 to 40 in

40 to 60 in

Very low

Low to moderate

1 to 2 in

4 to 6 in

1 in

2 in

Rapid

Moderately rapid

A

B

Excessively drained

Well drained

Rapid

Rapid

Moderate

Moderate

0.17

0.29

SM-GM-GP

ML

Intermediate

Intermediate

4ePX

3EPX

20 to 49

50 to 84

Poorly suited

Poorly suited

regeneration difficulty—b, d and e

Summer

Summer

Plant competition, steep slopes

IV

IV

Included in this unit are small areas of Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Chesaw family soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 60 percent gravel and cobbles. Typically, the surface layer is brown extremely cobbly loamy coarse sand about 16 inches thick. The substratum is brown very stony loamy coarse sand about 14 inches thick over highly weathered granitic rock.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown stony sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown very gravelly loamy fine sand and loamy fine sand about 46 inches thick over highly weathered granitic rock.

This unit is used mainly as rangeland in summer. It is also used for timber production.

221 Chesaw-Nanny families-Monache association, 2 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on the edges of upland basins and on mountainsides and ridges. Slope is 2 to 30 percent. The native plant communities are open stands of Yellow Pine Forest and Pinyon-Juniper Woodland with an understory of Sagebrush Scrub. Elevation is 7,870 to 8,400 feet. The average annual precipitation is about 14 to 20 inches.

This unit is 55 percent Chesaw family extremely cobbly loamy coarse sand, 30 percent Nanny family stony sandy loam, and 10 percent Monache very fine sandy loam.

Soil Map Unit Components

| | | | |
|--------------------------|----------------------------------------------------------------------------------------------------------------|------------------|-------------------------|
| Depth | 20 to 40 in | 40 to 60 in | 40 to 60+ in |
| Available Water Capacity | Very low | Low to moderate | Moderate |
| Total | 1 to 2 in | 4 to 6 in | 6 to 8 in |
| Upper 20" | 1 in | 2 in | 3 in |
| Permeability | Rapid | Moderately rapid | Moderate |
| Hydrologic Soil Group | A | B | B |
| Drainage Class | Excessively drained | Well drained | Moderately well drained |
| Runoff | Rapid | Medium | Slow |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.17 | 0.29 | 0.32 |
| Unified Soil Class | SM-GM-GP | ML | ML-SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 4ePX | 2epX | 2e |
| Timber Production | | | |
| CMAI (cu ft/acre) | 20 to 49 | 50 to 84 | |
| Suitability | Poorly suited | Poorly suited | Unsuitable |
| Limiting Factors | regeneration difficulty—b, d and e | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | IV | IV | IV |
| Included Areas & Remarks | Included in this are small areas of Rock outcrop. Included areas make up about 5 percent of the total acreage. | | |

Chesaw family

Nanny family

Monache

The Chesaw family soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 60 percent gravel and cobbles. Typically, the surface layer is brown extremely cobbly loamy coarse sand about 16 inches thick. The substratum is brown very stony loamy coarse sand about 14 inches thick over highly weathered granitic rock.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown stony sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy fine sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

The Monache soil is deep and formed in alluvium derived dominantly from granite. Typically, the surface layer is grayish brown very fine sandy loam about 23 inches thick. The substratum to a depth of 60 inches or more is brown loam and gravelly sandy loam. It has a few dark brown mottles. In some areas the surface layer is loam or fine sandy loam. The water table fluctuates between depths of 36 and 71 inches.

This unit is used mainly as rangeland in summer. It is also used for timber production.

224 Auberry sandy loam, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on foothills and mountainsides. It formed in residuum derived from granitic rock. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 3,480 to 4,790 feet. The average annual precipitation is about 24 to 35 inches.

Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

Soil Map Unit Components

Auberry

Depth

40 to 60+ in

Available Water Capacity

Moderate

Total

5 to 8 in

Upper 20"

3 in

Permeability

Moderately slow

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.20

Unified Soil Class

SM-SC

Soil & Rock Color

Intermediate

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils and Rock outcrop. Included areas make up about 10 percent of the total acreage.

This unit is used as rangeland in spring and summer.

225 Auberry sandy loam, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on foothills and mountainsides. It formed in residuum derived from granitic rock. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 2,950 to 5,000 feet. The average annual precipitation is about 24 to 39 inches.

Typically, the surface layer is brown sandy loam and sandy clay loam about 14 inches thick. The subsoil is brown sandy clay loam and clay loam about 28 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

Soil Map Unit Components

Auberry

Depth

40 to 60+ in

Available Water Capacity

Moderate

Total

5 to 8 in

Upper 20"

3 in

Permeability

Moderately slow

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.20

Unified Soil Class

SM-SC

Soil & Rock Color

Intermediate

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, shallow soils, steep slopes

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Cieneba soil and Rock outcrop. Included areas make up about 15 percent of the total acreage.

This unit is used as limited rangeland in spring and summer.

236 Livermore family-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills and mountainsides. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 3,510 to 7,020 feet. The average annual precipitation is about 8 to 30 inches.

This unit is 60 percent Livermore family stony sandy loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Livermore family

Rock outcrop

Depth

20 to 40 in

Available Water Capacity

Low to very low

Total

1 to 3 in

Upper 20"

2 in

Permeability

Moderate

Hydrologic Soil Group

C

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.20

Unified Soil Class

SC/GC

Soil & Rock Color

Low

Soil Manageability Class

2ep

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Chualar family soils. Included areas make up about 10 percent of the total acreage.

The Livermore family soil is moderately deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark brown stony and cobbly sandy loam about 18 inches thick. The subsoil is strong brown very gravelly sandy loam about 7 inches thick. The substratum is brown very gravelly sandy loam about 4 inches thick over fractured metasedimentary rock. Depth to rock ranges from 20 to 47 inches.

Rock outcrop occurs as isolated outcroppings and massive exposures of metasedimentary rock.

This unit is used as rangeland in spring and summer.

238 Livermore family-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills and mountainsides. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 3,610 to 7,020 feet. The average annual precipitation is about 8 to 30 inches.

This unit is 50 percent Livermore family stony sandy loam and 40 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Livermore family

Rock outcrop

Depth

20 to 40 in

Available Water Capacity

Low to very low

Total

1 to 3 in

Upper 20"

2 in

Permeability

Moderate

Hydrologic Soil Group

C

Drainage Class

Well drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.20

Unified Soil Class

SC/GC

Soil & Rock Color

Low

Soil Manageability Class

2Gp

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

rock outcrop, very steep slopes

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Chualar family soils. Included areas make up about 10 percent of the total acreage.

The Livermore family soil is moderately deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark brown stony and cobbly sandy loam about 18 inches thick. The subsoil is strong brown very gravelly sandy loam about 7 inches thick. The substratum is brown very gravelly sandy loam about 4 inches thick over fractured metasedimentary rock. Depth to rock ranges from 20 to 47 inches.

This unit is used as rangeland in spring and summer.

300 Xerofluvents-Xerorthents-Riverwash association, 0 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on canyonsides and mountainsides. Slope is 0 to 15 percent. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 3,200 to 5,400 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 35 percent Xerofluvents, 35 percent Xerorthents, and 30 percent Riverwash.

Soil Map Unit Components

Xerofluvents

Xerorthents

Riverwash

Depth

Varies

Varies

Available Water Capacity

Low

Low

Total

Varies

Varies

Upper 20"

Varies

Varies

Permeability

Varies

Varies

Hydrologic Soil Group

A

D

Drainage Class

Poorly drained or excessively drained

Well drained or somewhat excessively drained

Runoff

Medium or rapid

Medium or rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

—

—

Unified Soil Class

GP/GW

GP/GW

Soil & Rock Color

High

High

Soil Manageability Class

4ePX

4ePX

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

—

—

Incapable

Incapable

Range Production Seasons of Use Limiting Factors

Unsuitable

Unsuitable

Soil Manageability Group

IV

IV

Included Areas & Remarks

Xerofluvents formed in recent alluvium adjacent to the Kern River and its tributaries. These soils are deep and are gravelly, cobbly, and stony sand and sandy loam. They have many boulders and stones on the surface. Xerofluvents are subject to change by stream overflow, erosion, and deposition.

Xerorthents formed in unconsolidated recent colluvium. Texture and content of rock fragments is variable. The soils do not have distinct layers.

Riverwash is immediately adjacent to river channels. It is deep and is gravelly, cobbly, and stony sand, loamy sand, and sandy loam. A water table is at or near the surface. Deposition and removal of soil material are common.

This unit is not suited to timber production or to use as rangeland in summer because of stones and boulders, warm soil temperature, and the high water table. If the unit is used for recreational development, the main limitations are seasonal flooding, changes in the stream channel, boulders on the surface, and deposition.

301 Xerofluvents-Xerorthents association, 5 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on alluvial fans in the Scodie Mountains. Slope is mainly 5 to 15 percent. The native plant communities are Joshua Tree Woodland and Pinyon-Juniper Woodland. Elevation is 3,000 to 5,590 feet. The average annual precipitation is about 8 to 12 inches.

This unit is 45 percent Xerofluvents and 45 percent Xerorthents.

Soil Map Unit Components

Xerofluvents

Xerorthents

Depth

Varies

Varies

Available Water Capacity

Low

Low

Total

Varies

Varies

Upper 20"

Varies

Varies

Permeability

Varies

Varies

Hydrologic Soil Group

A

D

Drainage Class

Poorly drained through excessively drained

Well drained or somewhat excessively drained

Runoff

Medium or rapid

Medium or rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

—

—

Unified Soil Class

GP/GW

GP/GW

Soil & Rock Color

High

High

Soil Manageability Class

4EPX

4EPX

Timber Production

CMAI (cu ft/acre)

—

—

Suitability

Incapable

Incapable

Limiting Factors

Range Production

Seasons of Use

Unsuitable

Unsuitable

Limiting Factors

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Riverwash. Included areas make up about 10 percent of the total acreage.

Xerofluvents formed in alluvium. They are deep and are gravelly, cobbly, and stony sand and sandy loam. They have many boulders and stones on the surface. Xerofluvents are subject to change by stream overflow, erosion, and deposition.

Xerorthents formed in unconsolidated recent colluvium. Texture and content of rock fragments is variable. Xerorthents do not have distinct layers.

This unit is used as limited rangeland in summer.

302 Wind River family-Monache Variant, drained, warm association, 2 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is in upland basins and on the edges of upland basins. Slope is 2 to 15 percent. The native plant communities are Montane Meadow, Yellow Pine Forest, and Montane Chaparral. Elevation is 6,000 to 7,790 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 60 percent Wind River family loam and 20 percent Monache Variant, drained, warm soils.

Soil Map Unit Components

Wind River family

Monache variant

Depth Available Water Capacity Total Upper 20"

40 to 60+ in

40 to 60+ in

Permeability

Moderate

Moderate or slow

Hydrologic Soil Group

B

C

Drainage Class

Well drained or moderately well drained

Somewhat poorly drained

Runoff

Medium

Slow

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.20

Unified Soil Class

ML/SC

ML

Soil & Rock Color

Low

Low

Soil Manageability Class

2e

2ew

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

85 to 119

—

Suitable

Unsuitable

No prominent limitations

Range Production Seasons of Use Limiting Factors

Summer

Summer

Plant competition

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Holland and Dome soils and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, or granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 21 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.

The Monache Variant soil is deep and formed in mixed alluvium derived from granitic and metamorphic rock. Typically, the surface layer is gray and dark grayish brown loam, sandy loam, and silt loam about 23 inches thick. The substratum to a depth of 53 inches or more is stratified, grayish brown and brown sandy loam and silt loam. It has yellowish brown mottles.

The water table fluctuates between depths of 24 and 71 inches. It has been lowered as a result of stream entrenchment.

This unit is used mainly as rangeland in summer. It is also used for timber production.

303 Monache Variant, drained-Monache association, 0 to 5 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is in upland basins and on the edges of upland basins. Slope is 0 to 5 percent. The native plant communities are Montane Meadow, Lodgepole Pine Forest, and Sagebrush Scrub. Elevation is 6,500 to 9,000 feet. The average annual precipitation is about 18 to 51 inches.

This unit is 45 percent Monache Variant, drained soils and 40 percent Monache very fine sandy loam.

Soil Map Unit Components

Monache variant

Monache

Depth

40 to 60+ in

40 to 60+ in

Available Water Capacity

High

Moderate

Total

8 to 10 in

6 to 8 in

Upper 20"

3 in

2 in

Permeability

Moderate or slow

Moderate

Hydrologic Soil Group

D

B

Drainage Class

Somewhat poorly

Moderately drained, well drained

Runoff

Slow

Slow

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.37

0.32

Unified Soil Class

ML/CL

ML/SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ew

2ew

Timber Production

—

—

CMAI (cu ft/acre)

Incapable

Incapable

Suitability

Limiting Factors

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Cagwin, Toem, Cannell, and Cagwin Variant soils. Included areas make up about 15 percent of the total acreage.

The Monache Variant soil is deep and formed in mixed alluvium derived dominantly from granitic rock. Typically, the surface layer is grayish brown loam and very fine sandy loam about 22 inches thick. The substratum to a depth of 43 inches or more is dark brown and very dark grayish brown, stratified loamy sand and silt loam. It has yellowish brown mottles.

Effective rooting depth is 39 to 59 inches or more. The water table fluctuates between depths of 24 and 71 inches. It has been lowered as a result of stream entrenchment.

The Monache soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is grayish brown very fine sandy loam about 23 inches thick. The substratum to a depth of 60 inches or more is brown loam and gravelly sandy loam. It has dark brown mottles. In some areas the surface layer is loam or fine sandy loam.

The water table fluctuates between depths of 36 and 71 inches.

This unit is used as rangeland in summer.

306 Monache Variant, drained, warm-Junipero family association, 0 to 5 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is in upland basins. Slope is 0 to 5 percent. The native plant community is Montane Meadow. Elevation is 4,690 to 7,610 feet. The average annual precipitation is about 16 to 39 inches.

This unit is 65 percent Monache Variant, drained, warm soils and 25 percent Junipero family loam.

Soil Map Unit Components

Monache variant

Junipero family

Depth Available Water Capacity Total Upper 20"

40 to 60+ in

40 to 60+ in

Permeability

Moderate or slow

Moderate

Hydrologic Soil Group

C

B

Drainage Class

Somewhat poorly drained

Moderately well drained

Runoff

Slow

Medium

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.24

Unified Soil Class

ML

SC-SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ew

2ep

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

—

—

Incapable

Incapable

Range Production Seasons of Use Limiting Factors

Summer

Summer

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Dome and Chaix soils. Included areas make up about 10 percent of the total acreage.

The Monache Variant soil is deep and formed in mixed alluvium derived dominantly from granitic and metamorphic rock. Typically, the surface layer is dark grayish brown and gray loam, sandy loam, and silt loam about 23 inches thick. The substratum to a depth of 53 inches or more is stratified, grayish brown and brown sandy loam and silt loam. It has yellowish brown mottles.

The water table fluctuates between depths of 24 and 71 inches. It has been lowered as a result of stream entrenchment.

The Junipero family soil is deep formed in mixed alluvium derived dominantly from granitic and metamorphic rock. Typically, the surface layer is grayish brown loam about 12 inches thick. The subsoil is grayish brown sandy loam about 18 inches thick. The substratum to a depth of 60 inches or more is light brownish gray sandy loam and loamy sand. It has yellowish brown mottles.

The water table fluctuates between depths of 30 to 63 inches.

This unit is used as rangeland in summer.

309 Monache-Typic Haploxerolls-Cagwin Variant association, 0 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on the edge of upland basins and on mountainsides. Slope is 0 to 15 percent. The native plant communities are Montane Meadow, Lodgepole Pine Forest, and Sagebrush Scrub. Elevation is 6,560 to 8,010 feet. The average annual precipitation is about 14 to 45 inches.

This unit is 60 percent Monache very fine sandy loam, 20 percent Typic Haploxerolls, and 15 percent Cagwin Variant loamy coarse sand.

Soil Map Unit Components

| Monache | Typic Haploxerolls | Cagwin variant |
|---------|--------------------|----------------|
|---------|--------------------|----------------|

| | | | |
|--------------------------|-------------------------|-------------------------|---------------------|
| Depth | 40 to 60+ in | 40 to 60+ in | 60+ in |
| Available Water Capacity | Moderate | Low | Low to very low |
| Total | 6 to 8 in | 3 to 4 in | 2 to 3 in |
| Upper 20" | 1 in | 3 in | 1 in |
| Permeability | Moderate | Moderately rapid | Rapid |
| Hydrologic Soil Group | B | B | A |
| Drainage Class | Moderately well drained | Moderately well drained | Excessively drained |
| Runoff | Slow | Medium | Very slow |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.32 | 0.28 | 0.24 |
| Unified Soil Class | ML/SM | SM/GM | SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 2ep | 2e | 2ep |
| Timber Production | | | |
| CMAI (cu ft/acre) | — | — | 20 to 49 |
| Suitability | Incapable | Incapable | poorly suited |
| Limiting Factors | | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | II | II | II |

Included Areas & Remarks

Included in this unit are small areas of Chesaw family soils and Nanny family soils. Included areas make up about 5 percent of the total acreage.

The Monache soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is grayish brown very fine sandy loam about 23 inches thick. The substratum to a depth of 60 inches or more is brown loam and gravelly sandy loam. It has dark brown mottles. In some areas the surface layer is loam or fine sandy loam.

The water table fluctuates between depths of 36 and 71 inches.

The Typic Haploxerolls are moderately deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is brown fine sandy loam about 14 inches thick. The subsoil is pale brown fine sandy loam about 11 inches thick. The substratum to a depth of 39 inches or more is multicolored, mottled very gravelly coarse sand or gravelly loamy sand. In some areas the surface layer is loam or very fine sandy loam.

The water table fluctuates between depths of 59 and 99 inches.

The Cagwin Variant soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is dark yellowish brown loamy coarse sand about 4 inches thick. The substratum to a depth of 39 inches or more is light brownish gray and pale brown gravelly loamy coarse sand. In some areas the surface layer is loamy sand.

This unit is used as rangeland in summer.

310 Cagwin Variant loamy coarse sand, 5 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This deep soil is on toe slopes and alluvial fans adjacent to upland basins. It formed in alluvium derived dominantly from granitic rock. The native vegetation is mainly widely scattered Montane forbs or lodgepole pine. Elevation is 8,010 to 8,530 feet. The average annual precipitation is about 18 to 24 inches.

Typically, the surface layer is dark yellowish brown loamy coarse sand about 4 inches thick. The substratum to a depth of 39 inches or more is light brownish gray and pale brown gravelly loamy coarse sand.

Soil Map Unit Components

Cagwin variant

Depth

60+ in

Available Water Capacity

Low to very low

Total

2 to 3 in

Upper 20"

1 in

Permeability

Rapid

Hydrologic Soil Group

A

Drainage Class

Excessively drained

Runoff

Medium

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.24

Unified Soil Class

SM

Soil & Rock Color

Intermediate

Soil Manageability Class

3eP

Timber Production

CMAI (cu ft/acre)

20 to 49

Suitability

Poorly suited

Limiting Factors

Regeneration difficulty—b and d

Range Production

Seasons of Use

Unsuitable

Limiting Factors

Soil Manageability Group

III

Included Areas & Remarks

Included in this unit are small areas of Monache Variant soils, drained, Nanny family soils, and Chesaw family soils. Included areas make up about 10 percent of the total acreage.

This unit is used as wildlife habitat because of the widely scattered vegetation.

311 Cannell-Nanny family-Monache Variant association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges and in upland basins. Slope is 5 to 30 percent. The native plant communities are Red Fir Forest, White Fir Forest, Lodgepole Pine Forest, and Montane Meadow communities. Elevation is 7,220 to 8,530 feet. The average annual precipitation is about 20 to 30 inches.

This unit is 35 percent Cannell sandy loam, 25 percent Nanny family stony sandy loam, and 25 percent Monache Variant silt loam. The Monache Variant soil is in upland basins.

Soil Map Unit Components

Depth

40 to 60 in

40 to 60+ in

40 to 60+ in

Available Water Capacity

Moderate

Low to moderate

Moderate

Total

5 to 7 in

4 to 6 in

6 to 8 in

Upper 20"

2 in

2 in

3 in

Permeability

Moderately rapid

Moderately rapid

Slow

Hydrologic Soil Group

B

B

D

Drainage Class

Well drained

Well drained

Poorly drained

Runoff

Medium

Medium

Medium

Max Erosion Hazard

Moderate

Moderate

Moderate

Erosion Factor (K)

0.24

0.29

0.37

Unified Soil Class

SM

ML

ML/CL

Soil & Rock Color

Intermediate

Intermediate

Intermediate

Soil Manageability Class

2ep

3px

3eW

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

—

Suitability

Suitable

Suitable

Unsuitable

Limiting Factors

Regeneration difficulty—b and e

Range Production

Seasons of Use

Summer

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

II

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown stony sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

The Monache Variant soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface is covered with a dense mat of sedge roots 10 inches thick. The soil is black and very dark gray, stratified silt loam and silty clay loam. Reddish brown mottles are below a depth of 20 inches to a depth of 59 inches or more.

The water table fluctuates between the surface and a depth of 10 inches.

This unit is mainly used as timber production. It is also used as rangeland in summer.

400 Rock outcrop.

Physiographic
Location,
Elevation, and
Precipitation

Soil Map Unit
Components

Depth

Available Water Capacity
Total
Upper 20"

Permeability

Hydrologic Soil Group

Drainage Class

Runoff

Max Erosion Hazard

Erosion Factor (K)

Unified Soil Class

Soil & Rock Color

Soil Manageability
Class

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

Range Production
Seasons of Use
Limiting Factors

Soil Manageability
Group

Included Areas &
Remarks

This map unit consists of exposed areas of granitic, basic igneous, metamorphic, metasedimentary, and metavolcanic rock. These areas support little if any vegetation.

Rock outcrop

Included in this unit are small areas of shallow soils.

This unit is not suited to timber production, to use as rangeland in summer, or to recreational development. Some areas are used for mining.

This map unit is in soil manageability group IV.GDX.

404 Rock outcrop-Xerorthents association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on canyonsides, mountaintops, and ridges. Slope is 30 to 50 percent. The native plant community is Montane Chaparral. Elevation is 6,000 to 9,300 feet. The average annual precipitation is about 16 to 35 inches.

This unit is 65 percent Rock outcrop and 35 percent Xerorthents.

Soil Map Unit Components

Rock outcrop

Xerorthents

Depth

Varies

Available Water Capacity

Low

Total

Varies

Upper 20"

Varies

Permeability

Varies

Hydrologic Soil Group

D

Drainage Class

Well drained or somewhat excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

—

Unified Soil Class

GP-GW

Soil & Rock Color

High

Soil Manageability Class

4EPX

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Unsuitable

Limiting Factors

Soil Manageability Group

IV

Included Areas & Remarks

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic, metamorphic, and basic igneous rock.

Xerorthents formed in unconsolidated recent colluvium. Texture and the content of rock fragments are variable. Xerorthents do not have distinct soil layers.

This unit is used as habitat for wildlife. It is not suited to most other uses because of the potential instability of the Xerorthents and the areas of Rock outcrop.

409 Rock outcrop-Toem-Sirretta complex, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and Foxtail Limber Pine Forest. Elevation is 7,200 to 9,600 feet. The average annual precipitation is about 20 to 51 inches.

This unit is 40 percent Rock outcrop, 25 percent Toem loamy sand, and 15 percent Sirretta gravelly coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | | |
|--------------------------|--|--|
| Depth | | |
| Available Water Capacity | | |
| Total | | |
| Upper 20" | | |
| Permeability | | |
| Hydrologic Soil Group | | |
| Drainage Class | | |
| Runoff | | |
| Max Erosion Hazard | | |
| Erosion Factor (K) | | |
| Unified Soil Class | | |
| Soil & Rock Color | | |
| Soil Manageability Class | | |
| Timber Production | | |
| CMAI (cu ft/acre) | | |
| Suitability | | |
| Limiting Factors | | |
| Range Production | | |
| Seasons of Use | | |
| Limiting Factors | | |
| Soil Manageability Group | | |
| Included Areas & Remarks | | |

Rock outcrop

Toem

Sirretta

| | | |
|--------------------------|------------------------------------------------|---------------------|
| Depth | 4 to 20 in | 20 to 40 in |
| Available Water Capacity | Very low | Low to very low |
| Total | 1 to 2 in | 1 to 2 in |
| Upper 20" | 2 in | 1 in |
| Permeability | Rapid | Rapid |
| Hydrologic Soil Group | D | A |
| Drainage Class | Excessively drained | Excessively drained |
| Runoff | Rapid | Rapid |
| Max Erosion Hazard | Moderate | Moderate |
| Erosion Factor (K) | 0.32 | 0.17 |
| Unified Soil Class | SM | GM/SW |
| Soil & Rock Color | Intermediate | Intermediate |
| Soil Manageability Class | 2epd | 4ePX |
| Timber Production | | |
| CMAI (cu ft/acre) | 20 to 49 | 20 to 49 |
| Suitability | Poorly suited | Poorly suited |
| Limiting Factors | Regeneration difficulty—a, b, d, and e | |
| Range Production | | |
| Seasons of Use | Summer | Summer |
| Limiting Factors | Plant competition, rock outcrop, shallow soils | |
| Soil Manageability Group | IV | IV |

Included in this unit are small areas of Cagwin soils, Cannell soils, and Nanny family soils. Included areas make up about 20 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The substratum is brown and light yellowish brown extremely cobbly loamy sand about 22 inches thick over fractured granitic rock.

This unit is used mainly as limited rangeland in summer. It is also used for some timber production.

410 Rock outcrop-Toem complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant community is Montane Chaparral. Elevation is 6,400 to 9,600 feet. The average annual precipitation is about 20 to 51 inches.

This unit is 60 percent Rock outcrop and 30 percent Toem soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Toem

Depth

4 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Rapid

Hydrologic Soil Group

D

Drainage Class

Excessively drained

Runoff

Very rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

3EXp

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Unsuitable

Limiting Factors

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Cagwin soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

This unit is used as limited rangeland in summer.

411 Rock outcrop-Toem complex, 50 to 75 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides. The native plant community is Montane Chaparral. Elevation is 7,090 to 9,200 feet. The average annual precipitation is about 20 to 51 inches.

This unit is 60 percent Rock outcrop and 30 percent Toem soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Rock outcrop

Toem

Depth

4 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Rapid

Hydrologic Soil Group

D

Drainage Class

Excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability
Class

4GPX

Timber Production
CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Unsuitable

Limiting Factors

Soil Manageability
Group

IV

Included Areas &
Remarks

Included in this unit are small areas of Cagwin soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 8 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

This unit is used as limited rangeland in summer.

414 Rock outcrop-Chualar family complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Mixed Chaparral and Pinyon-Juniper Woodland. Elevation is 2,400 to 6,400 feet. The average annual precipitation is 10 to 30 inches.

This unit is 60 percent Rock outcrop and 30 percent Chualar family loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Chualar family

Depth

20 to 40 in

Available Water Capacity

Low to moderate

Total

4 to 6 in

Upper 20"

3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

ML/CL

Soil & Rock Color

Intermediate

Soil Manageability Class

4GX

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

Rock outcrop, shallow soils, very steep slopes, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of metamorphic, metasedimentary, and basic igneous rocks.

The Chualar family soil is moderately deep and formed in residuum derived from metamorphic, metasedimentary, and basic igneous rocks. Typically, the surface layer is dark brown loam about 9 inches thick. The subsoil is brown and yellowish brown clay loam about 20 inches thick over weathered basic igneous rock. In some areas the surface layer is sandy loam, fine sandy loam, or sandy clay loam.

This unit is used mainly as rangeland in spring and summer. It is also used for mining.

419 Rock outcrop-Cieneba complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 2,800 to 6,560 feet. The average annual precipitation is about 18 inches.

This unit is 65 percent Rock outcrop and 25 percent Cieneba coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Cieneba

Depth

4 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

1 in

Permeability

Moderately rapid

Hydrologic Soil Group

C

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

4EPXd

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

Soil Manageability Group

IV

Included Areas & Remarks

Rock outcrop, shallow soils, high erosion hazard

Included in this unit are small areas of Chualar family soils and Tollhouse family soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Cieneba soil is shallow and formed in residuum derived from granite rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used as rangeland in spring and summer.

420 Rock outcrop-Cieneba complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. The native plant communities are Foothill Woodland and Mixed Chaparral. Elevation is 1,810 to 7,710 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 75 percent Rock outcrop and 20 percent Cieneba coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Cieneba

Depth

4 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

1 in

Permeability

Moderately rapid

Hydrologic Soil Group

C

Drainage Class

Somewhat excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

4EPXd

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Spring and summer

Limiting Factors

Rock outcrop, shallow soils, very steep slopes, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Chualar family soils. Included areas make up about 5 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used as limited rangeland in spring and summer.

421 Rock outcrop-Tollhouse complex, 15 to 30 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Pinyon-Juniper Woodland and Sagebrush Scrub. Elevation is 5,000 to 8,200 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 60 percent Rock outcrop and 25 percent Tollhouse soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Rock outcrop

Tollhouse

Depth

8 to 20 in

Available Water Capacity
Total
Upper 20"

Very low
1 to 2 in
2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability
Class

2ep

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

—
Incapable

Range Production
Seasons of Use
Limiting Factors

Summer

Soil Manageability
Group

II

Included Areas &
Remarks

Rock outcrop, shallow soils, plant competition

Included in this unit are small areas of Chaix and Cieneba soils. Included areas make up about 15 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic or metamorphic rock.

The Tollhouse soil is shallow and formed in residuum derived dominantly from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

This unit is used as limited rangeland in summer.

422 Rock outcrop-Tollhouse complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Pinyon-Juniper Woodland and Sagebrush Scrub. Elevation is 4,790 to 8,400 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 65 percent Rock outcrop and 20 percent Tollhouse soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Tollhouse

Depth

8 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

4EPX

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

Rock outcrop, shallow soils, plant competition, steep slopes, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Chaix and Cieneba soils. Included areas make up about 15 percent of the total acreage.

Rock outcrop occurs mainly as isolated outcroppings and massive exposures of granitic or metasedimentary rock.

The Tollhouse soil is shallow and formed in residuum derived dominantly from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

This unit is used as limited rangeland in summer.

423 Rock outcrop-Tollhouse complex, 50 to 75 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Pinyon-Juniper Woodland and Sagebrush Scrub. Elevation is 4,400 to 8,790 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 55 percent Rock outcrop and 35 percent Tollhouse coarse sandy loam. The components of this map unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Rock outcrop

Tollhouse

Depth

8 to 20 in

Available Water Capacity
Total
Upper 20"

Very low
1 to 2 in
2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability
Class

4GPX

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

—
Incapable

Range Production
Seasons of Use
Limiting Factors

Summer

Soil Manageability
Group

IV

Included Areas &
Remarks

Rock outcrop, shallow soils, very steep slopes, plant competition very high erosion hazard

Included in this unit are small areas of Cieneba soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs mainly as isolated outcroppings and massive exposures of granitic or metamorphic rock.

The Tollhouse soil is shallow and formed in residuum derived dominantly from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

This unit is used as habitat for wildlife.

429 Rock outcrop-Cieneba-Chawanakee complex, 30 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. It is in a transitional area; soil temperature ranges from warm to cool. The native plant communities are Montane Chaparral, Mixed Chaparral, and Foothill Woodland. Elevation is 6,230 to 6,890 feet. The average annual precipitation is about 26 to 35 inches.

This unit is 70 percent Rock outcrop, 10 percent Cieneba soils, and 10 percent Chawanakee soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Cieneba

Chawanakee

Depth

4 to 20 in

8 to 20 in

Available Water Capacity

Very low

Very low

Total

1 to 2 in

1 to 2 in

Upper 20"

1 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

C

Drainage Class

Somewhat excessively drained

Somewhat excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.32

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

3Ep

4EDX

Timber Production

CMAI (cu ft/acre)

—

20 to 49

Suitability

Incapable

Poorly suited

Limiting Factors

Range Production

Seasons of Use

Spring and
summer

Spring and
summer

Limiting Factors

Rock outcrop, shallow soils, very steep slopes, very high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chaix and Tollhouse soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used as limited rangeland in spring and summer.

430 Rock outcrop-Chawanakee-Chaix complex, 15 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir Forest. Elevation is 6,400 to 8,040 feet. The average annual precipitation is about 26 to 45 inches.

This unit is 60 percent Rock outcrop, 20 percent Chawanakee coarse sandy loam, and 15 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Chawanakee

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively
drained

Well drained or somewhat
excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4ED

3Ep

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Rock outcrop, high erosion hazard, regeneration difficulty—a and d

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, shallow soils, plant competition, high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome, Toem, Cagwin, and Tollhouse soils. Included areas make up about 5 percent of the total acreage.

Rock outcrop occurs mainly as isolated outcroppings and massive exposures of granitic rock.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used for limited timber production and as rangeland in summer.

431 Rock outcrop-Chawanakee-Chaix complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir Forest. Elevation is 6,400 to 8,040 feet. The average annual precipitation is about 26 to 45 inches.

This unit is 60 percent Rock outcrop, 20 percent Chawanakee coarse sandy loam, and 15 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Chawanakee

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively
drained

Well drained or somewhat
excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Very high

High

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4EDX

4Ep

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Rock outcrop, very high erosion hazard, regeneration difficulty—a and d

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, shallow soils, steep slopes, plant competition, very high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome, Toem, and Cagwin soils. Included areas make up about 5 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock. Runoff is very rapid. Large quantities of water concentrate on soils downslope, which increases the erosion hazard of the soils.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used for limited timber production and as limited rangeland in summer.

432 Rock outcrop-Chawanakee-Chaix complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir Forest. Elevation is 5,910 to 8,300 feet. The average annual precipitation is about 26 to 39 inches.

This unit is 60 percent Rock outcrop, 20 percent Chawanakee coarse sandy loam, and 15 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Chawanakee

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively
drained

Well drained or somewhat
excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4GDX

3Gp

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Rock outcrop, shallow soils, very steep slopes, regeneration difficulty—a and d, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, shallow soils, very steep slopes, very high erosion hazard, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome, Toem, and Cagwin soils. Included areas make up about 5 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used as habitat for wildlife.

434 Rock outcrop-Baldmountain complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest, White Fir Forest, and Yellow Pine Forest. Elevation is 6,790 to 9,010 feet. The average annual precipitation is about 18 to 25 inches.

This unit is 50 percent Rock outcrop and 40 percent Baldmountain silt loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Baldmountain

Depth

40 to 60 in

Available Water Capacity Total Upper 20"

Moderate
7 to 9 in
3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.24

Unified Soil Class

CL/ML

Soil & Rock Color

Intermediate

Soil Manageability Class

3E

Timber Production CMAI (cu ft/acre) Suitability Limiting Factors

50 to 119
Suitable

Rock outcrop, high erosion hazard

Range Production Seasons of Use Limiting Factors

Summer

Rock outcrop, steep slopes, plant competition

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Tollhouse soils, Toem soils, Cagwin soils, and Wind River family soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs mainly as isolated outcroppings and massive exposures of metasedimentary or metamorphic rock.

The Baldmountain soil is deep and formed in residuum derived dominantly from metasedimentary or metamorphic rock. Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is brown silt loam and loam about 28 inches thick. The substratum is yellowish brown loam about 16 inches thick over highly weathered metasedimentary rock. In some areas the surface layer is loam.

This unit is used mainly for timber production. It is also used for mining and as limited rangeland in summer.

435 Rock outcrop-Baldmountain complex, 50 to 75 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest, White Fir Forest, and Yellow Pine Forest. Elevation is 7,185 to 10,007 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 50 percent Rock outcrop and 40 percent Baldmountain silt loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Rock outcrop

Baldmountain

Depth

40 to 60 in

Available Water Capacity
Total
Upper 20"

Moderate
7 to 9 in
3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.24

Unified Soil Class

CL/ML

Soil & Rock Color

Intermediate

Soil Manageability
Class

3G

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

50 to 119
Suitable

Very steep slopes, rock outcrop, very high erosion hazard

Range Production
Seasons of Use
Limiting Factors

Summer

Rock outcrop, very steep slopes, plant competition

Soil Manageability
Group

IV

Included Areas &
Remarks

Included in this unit are small areas of Toem, Cagwin, and Cannell soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of metasedimentary or metamorphic rock.

The Baldmountain soil is deep and formed in residuum derived dominantly from metasedimentary or metamorphic rock. Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is brown silt loam and loam about 28 inches thick. The substratum is yellowish brown loam about 16 inches thick over highly weathered metasedimentary rock. In some areas the surface layer is loam.

This unit is used mainly for timber production. It is also used for mining and as limited rangeland in summer.

443 Rubble land-Xerorthents complex, 5 to 30 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. It supports little if any vegetation. Elevation is 9,790 to 11,210 feet. The average annual precipitation is about 20 to 30 inches.

This unit is 50 percent Rubble land and 30 percent Xerorthents. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Rubble land

Xerorthents

Depth

Varies

Available Water Capacity

Low

Total

Varies

Upper 20"

Varies

Permeability

Varies

Hydrologic Soil Group

D

Drainage Class

Well drained or somewhat excessively drained

Runoff

Medium or rapid

Max Erosion Hazard

High

Erosion Factor (K)

Varies

Unified Soil Class

GP-GW

Soil & Rock Color

High

Soil Manageability
Class

4EPX

Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors

—
Incapable

Range Production
Seasons of Use
Limiting Factors

Unsuitable

Soil Manageability
Group

IV

Included Areas &
Remarks

Included in this unit are small areas of Rock outcrop. Included areas make up about 20 percent of the total acreage.

Rubble land consists of areas of cobbles, stones, and boulders.

Xerorthents formed in unconsolidated recent colluvium. Texture and the content of rock fragments are variable. Xerorthents do not have distinct layers.

444 Rock outcrop-Brader-Siskiyou families complex, 20 to 60 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 3,280 to 8,040 feet. The average annual precipitation is about 14 to 26 inches.

This unit is 60 percent Rock outcrop, 20 percent Brader family gravelly coarse sandy loam, and 15 percent Siskiyou family loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Brader family

Siskiyou family

Depth

8 to 20 in

20 to 30 in

Available Water Capacity

Low to very low

Low

Total

1 to 3 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively
drained

Well drained or somewhat
excessively drained

Runoff

Rapid to very rapid

Rapid to very rapid

Max Erosion Hazard

Very high

High

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4ED

3Ep

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—d and f, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, steep slopes, plant competition, very high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome, Chaix and Chawanakee soils. Included areas make up about 5 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Brader family soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown gravelly coarse sandy loam about 6 inches thick. The subsoil is light yellowish brown gravelly sandy loam about 10 inches thick over highly weathered granitic rock.

The Siskiyou family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown gravelly coarse sandy loam about 18 inches thick. The substratum is brown gravelly sandy loam about 5 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used for limited timber production and as limited rangeland in summer.

445 Rock outcrop-Cieneba-Brader family complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. It is in a transitional area; soil temperature ranges from warm to cool. The native plant communities are Foothill Woodland, Mixed Chaparral, and Montane Chaparral. Elevation is 3,280 to 7,380 feet. The average annual precipitation is about 8 to 26 inches.

This unit is 70 percent Rock outcrop, 10 percent Cieneba coarse sandy loam, and 10 percent Brader family gravelly coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Rock outcrop

Cieneba

Brader family

Depth

4 to 20 in

8 to 20 in

Available Water Capacity

Very low

Low to very low

Total

1 to 2 in

1 to 3 in

Upper 20"

1 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

C

Drainage Class

Somewhat excessively
drained

Somewhat excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.32

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

3GD

4GD

Timber Production

CMAI (cu ft/acre)

—

20 to 49

Suitability

Unsuitable

Poorly suited

Limiting Factors

Range Production

Seasons of Use

Spring and
summer

Spring and
summer

Limiting Factors

Rock outcrop, shallow soils, very high erosion hazard, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chawanakee soils, Siskiyou family soils, and Tollhouse soils. Included areas make up about 10 percent of the total acreage.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. Typically, the soil is pale brown coarse sandy loam about 12 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Brader family soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown gravelly coarse sandy loam about 6 inches thick. The subsoil is light yellowish brown gravelly sandy loam about 10 inches thick over highly weathered granitic rock.

This unit is used as limited rangeland in spring and summer.

446 Siskiyou-Brader families-Rock outcrop complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 5,970 to 7,810 feet. The average annual precipitation is about 14 to 26 inches.

This unit is 55 percent Siskiyou family loam, 25 percent Brader family gravelly coarse sandy loam, and 10 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Siskiyou family

Brader family

Rock outcrop

Depth

20 to 30 in

8 to 20 in

Available Water Capacity

Low

Low to very low

Total

3 to 4 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained or somewhat
excessively drained

Somewhat excessively
drained

Runoff

Rapid to medium

Rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.24

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ep

3eD

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, shallow soils

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Chaix, Chawanakee, and Dome soils. Included areas make up about 10 percent of the total acreage.

The Siskiyou family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown gravelly sandy loam about 18 inches thick. The substratum is brown gravelly coarse sandy loam about 5 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Brader family soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown gravelly coarse sandy loam about 6 inches thick. The subsoil is light yellowish brown gravelly sandy loam about 10 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

447 Siskiyou family-Rock outcrop-Brader family complex, 30 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 4,860 to 8,040 feet. The average annual precipitation is about 10 to 26 inches.

This unit is 45 percent Siskiyou family loam, 30 percent Rock outcrop, and 20 percent Brader family coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Siskiyou family

Rock outcrop

Brader family

Depth

20 to 30 in

8 to 20 in

Available Water Capacity

Low

Low to very low

Total

3 to 4 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

C

Drainage Class

Well drained or somewhat
excessively drained

Somewhat excessively drained

Runoff

Very rapid to rapid

Very rapid to rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

4ED

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—d and f, very steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, plant competition, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chaix, Chawanakee, and Dome soils. Included areas make up about 5 percent of the total acreage.

The Siskiyou family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown gravelly sandy loam about 18 inches thick. The substratum is brown gravelly coarse sandy loam about 5 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Brader family soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is brown coarse sandy loam about 6 inches thick. The subsoil is light yellowish brown sandy loam about 10 inches thick over highly weathered granitic rock.

This unit is used mainly as limited rangeland in summer. It is also used for limited timber production.

500 Tollhouse-Rock outcrop complex, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Pinyon-Juniper Woodland, Sagebrush Scrub, and Montane Chaparral. Elevation is 5,810 to 8,200 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 65 percent Tollhouse coarse sandy loam and 25 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Tollhouse

Rock outcrop

Depth

8 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

2epd

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

rock outcrop, plant competition, shallow soils

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Chaix soils. Included areas make up about 10 percent of the total acreage.

The Tollhouse soil is shallow and formed in residuum derived dominantly from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic or metamorphic rock.

This unit is used as rangeland in summer.

501 Tollhouse-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Pinyon-Juniper Woodland, Sagebrush Scrub, and Montane Chaparral. Elevation is 6,000 to 6,600 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 65 percent Tollhouse coarse sandy loam and 25 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Tollhouse

Rock outcrop

Depth

8 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

3Ep

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

rock outcrop, steep slopes, plant competition, shallow soils, high erosion hazard

Soil Manageability Group

III

Included Areas & Remarks

Included in this unit are small areas of Cieneba soils. Included areas make up about 10 percent of the total acreage.

The Tollhouse soil is shallow and formed in residuum derived from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic or metamorphic rock.

This unit is used as limited rangeland in summer.

502 Tollhouse-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Pinyon-Juniper Woodland, Mountain Sagebrush Scrub, and Montane Chaparral. Elevation is 4,400 to 8,010 feet. The average annual precipitation is about 12 to 24 inches.

This unit is 55 percent Tollhouse coarse sandy loam and 35 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Tollhouse

Rock outcrop

Depth

8 to 20 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

D

Drainage Class

Somewhat excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.32

Unified Soil Class

SM

Soil & Rock Color

High

Soil Manageability Class

3Ep

Timber Production

CMAI (cu ft/acre)

—

Suitability

Incapable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

rock outcrop, very steep slopes, plant competition, shallow soils, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Cienega soils. Included areas make up about 10 percent of the total acreage.

The Tollhouse soil is shallow and formed in residuum derived from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic or metamorphic rock.

This unit is used as limited rangeland in summer.

503 Tollhouse-Chaix association, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 10 to 30 percent. The native plant communities are Juniper Woodland, Sagebrush Scrub, and Montane Chaparral. Elevation is 5,000 to 6,990 feet. The average annual precipitation is about 12 to 35 inches.

This unit is 70 percent Tollhouse coarse sandy loam and 20 percent Chaix sandy loam.

Soil Map Unit Components

Tollhouse

Chaix*

Depth
Available Water Capacity
 Total
 Upper 20"
Permeability
Hydrologic Soil Group
Drainage Class
Runoff
Max Erosion Hazard
Erosion Factor (K)
Unified Soil Class
Soil & Rock Color
Soil Manageability
Class
Timber Production
 CMAI (cu ft/acre)
 Suitability
 Limiting Factors
Range Production
 Seasons of Use
 Limiting Factors
Soil Manageability
Group
Included Areas &
Remarks

8 to 20 in

20 to 40 in

Very low

Low

1 to 2 in

3 to 4 in

2 in

2 in

Moderately rapid

Moderately rapid

D

B

Somewhat excessively drained

Well drained or somewhat excessively drained

Rapid

Medium to rapid

Moderate

Moderate

0.32

0.24

SM

SM

High

High

2ep

2ep

—

50 to 84

Unsuitable

Poorly suited

Summer

Summer

Plant competition, shallow soils

II

II

Included in this unit are small areas of Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Tollhouse soil is shallow and formed in residuum derived from granitic or metamorphic rock. Typically, the soil is brown coarse sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used as rangeland in summer.

* Footnote: Vegetation not typical for the Chaix series.

509 Chaix-Wind River family-Tollhouse association, 5 to 15 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and in upland basins. Slope is 5 to 15 percent. The native plant communities are Pinyon-Juniper Woodland, Sagebrush Scrub, Yellow Pine Forest, and Montane Chaparral. Elevation is 5,250 to 7,870 feet. The average annual precipitation is about 12 to 20 inches.

This unit is 50 percent Chaix sandy loam, 25 percent Wind River family loam, and 15 percent Tollhouse coarse sandy loam.

Soil Map Unit Components

| | Chaix* | Wind River family | Tollhouse |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|
| Depth | 20 to 40 in | 40 to 60+ in | 8 to 20 in |
| Available Water Capacity | Low | Low to moderate | Very low |
| Total | 3 to 4 in | 4 to 6 in | 1 to 2 in |
| Upper 20" | 2 in | 3 in | 2 in |
| Permeability | Moderately rapid | Moderate | Moderately rapid |
| Hydrologic Soil Group | B | B | D |
| Drainage Class | Well drained or somewhat excessively drained | Well or moderately well drained | Somewhat excessively drained |
| Runoff | Medium | Medium | Medium |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.24 | 0.20 | 0.32 |
| Unified Soil Class | SM | ML/SC | SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 2ep | 2e | 3e |
| Timber Production | | | |
| CMAI (cu ft/acre) | 50 to 84 | 85 to 119 | — |
| Suitability | Poorly suited | Suitable | Incapable |
| Limiting Factors | regeneration difficulty—a, d, and f | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | II | II | II |
| Included Areas & Remarks | <p>Included in this unit are small areas of Rock outcrop. Included areas make up about 10 percent of the total acreage.</p> <p>The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.</p> <p>The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, or granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 20 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.</p> <p>The Tollhouse soil is shallow and formed in residuum derived from granitic or metasedimentary rock. Typically, the surface layer is brown coarse sandy loam about 7 inches thick. The subsoil is brown loamy sand about 16 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam or silt loam.</p> <p>This unit is used mainly as rangeland in summer. It is also used for limited timber production.</p> | | |

* Footnote: Vegetation not typical for the Chaix series.

601 Brownlee family-Hotaw Variant complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 3,940 to 6,990 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 60 percent Brownlee family very fine sandy loam and 30 percent Hotaw Variant loam. The components of this map unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Brownlee family

Hotaw variant

Depth

60+ in

20 to 30 in

Available Water Capacity

Moderate

Low

Total

5 to 9 in

3 to 5 in

Upper 20"

3 in

2 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid

Medium or rapid

Max Erosion Hazard

High

Moderate

Erosion Factor (K)

0.37

0.37

Unified Soil Class

ML-CL/SC

SC/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3E

2e

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Steep slopes

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Brownlee family soil is deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is brown very fine sandy loam and loam about 15 inches thick. The subsoil is yellowish brown and brownish yellow sandy clay loam about 51 inches thick over weathered metamorphic rock.

The Hotaw Variant soil is moderately deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is dark brown gravelly loam and gravelly clay loam about 23 inches thick over fractured metasedimentary rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

603 Cannell-Sirretta-Nanny family complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest, White Fir Forest, and Lodgepole Pine Forest. Elevation is 7,220 to 9,810 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 35 percent Cannell sandy loam, 25 percent Sirretta gravelly coarse sandy loam, and 20 percent Nanny family stony sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | Cannell | Sirretta | Nanny family |
|--------------------------|-------------------------------------|---------------------|---------------------|
| Depth | 40 to 60 in | 20 to 40 in | 60+ in |
| Available Water Capacity | Moderate | Low to very low | Moderate to low |
| Total | 5 to 7 in | 1 to 2 in | 4 to 6 in |
| Upper 20" | 2 in | 1 in | 2 in |
| Permeability | Moderately rapid | Rapid | Moderately rapid |
| Hydrologic Soil Group | B | A | B |
| Drainage Class | Well drained | Excessively drained | Well drained |
| Runoff | Medium to rapid | Medium to rapid | Medium to rapid |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.20 | 0.17 | 0.29 |
| Unified Soil Class | SM | GM/SW | SM/GM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 2ep | 4ePX | 3epX |
| Timber Production | | | |
| CMAI (cu ft/acre) | 85 to 119 | 20 to 49 | 50 to 84 |
| Suitability | Suitable | Suitable | Suitable |
| Limiting Factors | Regeneration difficulty—b, d, and e | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | II | II | II |

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop, Toem soils, Cagwin soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 20 percent of the total acreage.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The substratum is brown and light yellowish brown extremely cobbly loamy sand about 22 inches thick over fractured granitic rock.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown stony sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy fine sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

604 Cannell-Sirretta-Nanny family complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest, White Fir Forest, and Lodgepole Pine Forest. Elevation is 7,220 to 9,020 feet. The average annual precipitation is about 24 to 45 inches.

This unit is 35 percent Cannell sandy loam, 25 percent Sirretta gravelly coarse sandy loam, and 20 percent Nanny family stony sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | | | |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------|
| Depth | 40 to 60 in | 20 to 40 in | 60+ in |
| Available Water Capacity | Moderate | Low to very low | Moderate to low |
| Total | 5 to 7 in | 1 to 2 in | 4 to 6 in |
| Upper 20" | 2 in | 1 in | 2 in |
| Permeability | Moderately rapid | Rapid | Moderately rapid |
| Hydrologic Soil Group | B | A | B |
| Drainage Class | Well drained | Excessively drained | Well drained |
| Runoff | Rapid | Rapid | Rapid |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.20 | 0.17 | 0.29 |
| Unified Soil Class | SM | GM/SW | SM/GM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 2ep | 4ePX | 4EpX |
| Timber Production | | | |
| CMAI (cu ft/acre) | 85 to 119 | 20 to 49 | 50 to 84 |
| Suitability | Suitable | Suitable | Suitable |
| Limiting Factors | Regeneration difficulty—b, d, and e | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Steep slopes, plant competition | | |
| Soil Manageability Group | IV | IV | IV |
| Included Areas & Remarks | Included in this unit are small areas of Rock outcrop, Toem soils, Cagwin soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 20 percent of the total acreage. | | |

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The substratum is brown and light yellowish brown extremely cobbly loamy sand about 22 inches thick over fractured granitic rock.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown stony sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy fine sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

606 Toem-Rock outcrop-Cagwin complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Lodgepole Pine Forest, Red Fir Forest, and Montane Chaparral. Elevation is 6,400 to 9,600 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 45 percent Toem loamy sand, 30 percent Rock outcrop, and 15 percent Cagwin loamy sand. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | Toem | Rock outcrop | Cagwin |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------|
| Depth | 4 to 20 in | | 20 to 40 in |
| Available Water Capacity | Very low | | Very low |
| Total | 1 to 2 in | | 1 to 2 in |
| Upper 20" | 2 in | | 2 in |
| Permeability | Rapid | | Rapid |
| Hydrologic Soil Group | D | | C |
| Drainage Class | Excessively drained | | Somewhat excessively drained |
| Runoff | Rapid | | Rapid |
| Max Erosion Hazard | Moderate | | Moderate |
| Erosion Factor (K) | 0.32 | | 0.29 |
| Unified Soil Class | SM | | SM |
| Soil & Rock Color | Intermediate | | Intermediate |
| Soil Manageability Class | 2edp | | 2ep |
| Timber Production | | | |
| CMAI (cu ft/acre) | 20 to 49 | | 50 to 84 |
| Suitability | Poorly suited | | Poorly suited |
| Limiting Factors | Regeneration difficulty—a, b, and d | | |
| Range Production | | | |
| Seasons of Use | Summer | | Summer |
| Limiting Factors | Rock outcrop, plant competition, shallow soils | | |
| Soil Manageability Group | II | | II |
| Included Areas & Remarks | <p>Included in this unit are small areas of Sirretta soils, Cannell soils, Nanny family soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 10 percent of the total acreage.</p> <p>The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.</p> <p>Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.</p> <p>The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand about 21 inches thick over highly weathered granitic rock. In some areas the surface layer is loamy coarse sand.</p> <p>This unit is used mainly for timber production. It is also used for rangeland in summer.</p> | | |

607 Toem-Rock outcrop-Cagwin complex, 30 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Lodgepole Pine Forest, Red Fir Forest, and Montane Chaparral. Elevation is 6,400 to 9,890 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 45 percent Toem loamy sand, 30 percent Rock outcrop, and 15 percent Cagwin loamy sand. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Depth | 4 to 20 in | 20 to 40 in |
| Available Water Capacity | Very low | Very low |
| Total | 1 to 2 in | 1 to 2 in |
| Upper 20" | 2 in | 2 in |
| Permeability | Rapid | Rapid |
| Hydrologic Soil Group | D | C |
| Drainage Class | Excessively drained | Somewhat excessively drained |
| Runoff | Very rapid | Very rapid |
| Max Erosion Hazard | Very high | Very high |
| Erosion Factor (K) | 0.32 | 0.29 |
| Unified Soil Class | SM | SM |
| Soil & Rock Color | Intermediate | Intermediate |
| Soil Manageability Class | 3Ed | 3Ep |
| Timber Production | | |
| CMAI (cu ft/acre) | 20 to 49 | 50 to 84 |
| Suitability | Poorly suited | Poorly suited |
| Limiting Factors | Regeneration difficulty—a, b and d, very high erosion hazard | |
| Range Production | | |
| Seasons of Use | Summer | Summer |
| Limiting Factors | Rock outcrop, shallow soil, very steep slopes, plant competition, very high erosion hazard | |
| Soil Manageability Group | III | III |
| Included Areas & Remarks | Included in this unit are small areas of Sirretta soils, Cannell soils, Nanny family soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 10 percent of the total acreage. | |

Toem

Rock outcrop

Cagwin

4 to 20 in

20 to 40 in

Very low

Very low

1 to 2 in

1 to 2 in

2 in

2 in

Rapid

Rapid

D

C

Excessively drained

Somewhat excessively drained

Very rapid

Very rapid

Very high

Very high

0.32

0.29

SM

SM

Intermediate

Intermediate

3Ed

3Ep

20 to 49

50 to 84

Poorly suited

Poorly suited

Regeneration difficulty—a, b and d, very high erosion hazard

Summer

Summer

Rock outcrop, shallow soil, very steep slopes, plant competition, very high erosion hazard

III

III

Included in this unit are small areas of Sirretta soils, Cannell soils, Nanny family soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 10 percent of the total acreage.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granite.

The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand about 21 inches thick over highly weathered granitic rock. In some areas the surface layer is loamy coarse sand.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

609 Cagwin-Toem-Rock outcrop complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest and Lodgepole Pine Forest. Elevation is 7,220 to 9,580 feet. The average annual precipitation is about 24 to 49 inches.

This unit is 45 percent Cagwin loamy sand, 25 percent Toem loamy sand, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Cagwin Toem Rock outcrop

| | | | |
|--------------------------|-----------------------------------------------------|---------------------|--|
| Depth | 20 to 40 in | 4 to 20 in | |
| Available Water Capacity | Very low | Very low | |
| Total | 1 to 2 in | 1 to 2 in | |
| Upper 20" | 2 in | 2 in | |
| Permeability | Rapid | Rapid | |
| Hydrologic Soil Group | C | D | |
| Drainage Class | Somewhat excessively drained | Excessively drained | |
| Runoff | Rapid | Rapid | |
| Max Erosion Hazard | Moderate | Moderate | |
| Erosion Factor (K) | 0.29 | 0.32 | |
| Unified Soil Class | SM | SM | |
| Soil & Rock Color | Intermediate | Intermediate | |
| Soil Manageability Class | 2ep | 2ed | |
| Timber Production | | | |
| CMAI (cu ft/acre) | 50 to 84 | 20 to 49 | |
| Suitability | Poorly suited | Poorly suited | |
| Limiting Factors | Regeneration difficulty—a, b, and d, erosion hazard | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | |
| Limiting Factors | Plant competition, shallow soils, rock outcrop | | |
| Soil Manageability Group | II | II | |

Included Areas & Remarks

Included in this unit are small areas of Sirretta soils, Cannell soils, Nanny family soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 15 percent of the total acreage.

The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand 21 inches thick over highly weathered granitic rock. In some areas the surface layer is loamy coarse sand.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

610 Cagwin-Toem-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest and Lodgepole Pine Forest. Elevation is 7,220 to 9,200 feet. The average annual precipitation is about 24 to 49 inches.

This unit is 45 percent Cagwin loamy sand, 25 percent Toem loamy sand, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Cagwin

Toem

Rock outcrop

Depth

20 to 40 in

4 to 20 in

Available Water Capacity

Very low

Very low

Total

1 to 2 in

1 to 2 in

Upper 20"

2 in

2 in

Permeability

Rapid

Rapid

Hydrologic Soil Group

C

D

Drainage Class

Somewhat excessively drained

Excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.29

0.32

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3Ep

3Ed

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, b and d, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes, shallow soils, rock outcrop

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of Sirretta soils, Cannell soils, Nanny family soils, Monache soils, and Monache Variant soils, drained. Included areas make up about 15 percent of the total acreage.

The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand 21 inches thick over highly weathered granitic rock. In some areas the surface layer is loamy coarse sand.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

611 Cagwin-Toem-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest, Lodgepole Pine Forest, and Montane Chaparral. Elevation is 7,550 to 9,190 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 45 percent Cagwin loamy sand, 25 percent Toem loamy sand, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Cagwin

Toem

Rock outcrop

Depth

20 to 40 in

4 to 20 in

Available Water Capacity

Very low

Very low

Total

1 to 2 in

1 to 2 in

Upper 20"

2 in

2 in

Permeability

Rapid

Rapid

Hydrologic Soil Group

C

D

Drainage Class

Somewhat excessively drained

Excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.29

0.32

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Gp

3Gd

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, b and d, steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, very steep slopes, shallow soils, rock outcrop

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Sirretta soils, Cannell soils, and Nanny family soils. Included areas make up about 15 percent of the total acreage.

The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand 21 inches thick over highly weathered granitic rock. In some areas the surface layer is loamy coarse sand.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

612 Baldmountain-Rock outcrop-Jumpe family complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and White Fir Forest. Elevation is 7,220 to 8,530 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 50 percent Baldmountain silt loam, 20 percent Rock outcrop, and 20 percent Jumpe family sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| | | |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Depth | 40 to 60 in | 60+ in |
| Available Water Capacity | Moderate | Low |
| Total | 7 to 9 in | 3 to 5 in |
| Upper 20" | 3 in | 2 in |
| Permeability | Moderate | Moderately rapid |
| Hydrologic Soil Group | B | B |
| Drainage Class | Well drained | Well drained |
| Runoff | Medium | Medium |
| Max Erosion Hazard | Moderate | Moderate |
| Erosion Factor (K) | 0.24 | 0.17 |
| Unified Soil Class | CL/ML | SM/GM |
| Soil & Rock Color | Low | Low |
| Soil Manageability Class | 2e | 2ep |
| Timber Production | | |
| CMAI (cu ft/acre) | 50 to 119 | 50 to 84 |
| Suitability | Suitable | Suitable |
| Limiting Factors | Regeneration difficulty—b and e | |
| Range Production | | |
| Seasons of Use | Summer | Summer |
| Limiting Factors | Plant competition | |
| Soil Manageability Group | II | II |
| Included Areas & Remarks | <p>Included in this unit are small areas of Toem soils, Cagwin soils, Cannell soils, and Nanny family soils. Included areas make up about 10 percent of the total acreage.</p> <p>The Baldmountain soil is deep and formed in residuum derived from metasedimentary or metamorphic rock. Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is brown silt loam and loam about 28 inches thick. The substratum is yellowish brown loam about 16 inches thick over highly weathered metasedimentary rock. In some areas the surface layer is loam.</p> <p>Rock outcrop occurs as small, isolated outcroppings and massive exposures of metamorphic or metasedimentary rock.</p> <p>The Jumpe family soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is brown gravelly fine sandy loam about 16 inches thick. The substratum is reddish yellow very gravelly loam and extremely gravelly and cobbly fine sandy loam about 28 inches over fractured metasedimentary rock.</p> <p>This unit is used mainly for timber production. It is also used for mining and as rangeland in summer.</p> | |

Baldmountain

Rock outcrop

Jumpe family

613 Baldmountain-Rock outcrop-Jumpe family complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and White Fir Forest. Elevation is 7,220 to 8,530 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 40 percent Baldmountain silt loam, 30 percent Rock outcrop, and 20 percent Jumpe family sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Baldmountain

Rock outcrop

Jumpe family

Depth
Available Water Capacity
Total
Upper 20"
Permeability
Hydrologic Soil Group
Drainage Class
Runoff
Max Erosion Hazard
Erosion Factor (K)
Unified Soil Class
Soil & Rock Color
Soil Manageability
Class
Timber Production
CMAI (cu ft/acre)
Suitability
Limiting Factors
Range Production
Seasons of Use
Limiting Factors
Soil Manageability
Group
Included Areas &
Remarks

40 to 60 in

Moderate

7 to 9 in

3 in

Moderate

B

Well drained

Rapid

High

0.24

CL/ML

Low

3E

50 to 119

Suitable

Regeneration difficulty—b and d, high erosion hazard

Summer

Plant competition, steep slopes, rock outcrop

III

Included in this unit are small areas of Toem soils, Cagwin soils, Cannell soils, and Nanny family soils. Included areas make up about 10 percent of the total acreage.

The Baldmountain soil is deep and formed in residuum derived from metasedimentary or metamorphic rock. Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is brown silt loam and loam about 28 inches thick. The substratum is yellowish brown loam about 16 inches thick over highly weathered metasedimentary rock. In some areas the surface layer is loam.

Rock outcrop occurs as small isolated outcroppings and massive exposures of metamorphic or metasedimentary rock.

The Jumpe family soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil is brown gravelly fine sandy loam about 16 inches thick. The substratum is reddish yellow very gravelly loam and extremely gravelly and cobbly fine sandy loam about 28 inches over fractured metasedimentary rock.

This unit is used mainly for timber production. It is also used for mining and as limited rangeland in summer.

40 to 60+ in

Low

3 to 5 in

2 in

Moderately rapid

B

Well drained

Rapid

High

0.17

SM/GM

Low

3Ep

50 to 84

Suitable

Summer

III

618 Chaix-Chawanakee-Rock outcrop complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 4,400 to 7,870 feet. The average annual precipitation is about 26 to 39 inches.

This unit is 55 percent Chaix sandy loam, 25 percent Chawanakee coarse sandy loam, and 10 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix Chawanakee Rock outcrop

| | | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Depth | 20 to 40 in | 8 to 20 in |
| Available Water Capacity | Low | Low to very low |
| Total | 3 to 4 in | 1 to 3 in |
| Upper 20" | 2 in | 1 in |
| Permeability | Moderately rapid | Moderately rapid |
| Hydrologic Soil Group | B | C |
| Drainage Class | Well drained or somewhat excessively drained | Somewhat excessively drained |
| Runoff | Medium to rapid | Rapid |
| Max Erosion Hazard | Moderate | Moderate |
| Erosion Factor (K) | 0.24 | 0.28 |
| Unified Soil Class | SM | SM |
| Soil & Rock Color | Intermediate | Intermediate |
| Soil Manageability Class | 2ep | 3eD |
| Timber Production | | |
| CMAI (cu ft/acre) | 50 to 84 | 20 to 49 |
| Suitability | Poorly suited | Poorly suited |
| Limiting Factors | Regeneration difficulty—a, d, and f. | |
| Range Production | | |
| Seasons of Use | Summer | Summer |
| Limiting Factors | Plant competition, rock outcrop, shallow soils | |
| Soil Manageability Group | II | II |
| Included Areas & Remarks | Included in this unit are small areas of Dome and Holland soils. Included areas make up about 10 percent of the total acreage. | |

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

619 Chaix-Rock outcrop-Chawanakee complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest, Mixed Conifer Forest, and Montane Chaparral. Elevation is 5,910 to 8,040 feet. The average annual precipitation is about 26 to 32 inches.

This unit is 45 percent Chaix sandy loam, 30 percent Rock outcrop, and 15 percent Chawanakee coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix

Rock outcrop

Chawanakee

Depth

20 to 40 in

8 to 20 in

Available Water Capacity

Low

Low to very low

Total

3 to 4 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Somewhat excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

4ED

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, d, and f, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

steep slopes, rock outcrop

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Dome and Holland soils. Included areas make up about 10 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used mainly as limited rangeland in summer. It is also used for limited timber production.

620 Chaix-Rock outcrop-Chawanakee complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest, Mixed Conifer Forest, and Montane Chaparral. Elevation is 4,920 to 7,550 feet. The average annual precipitation is about 26 to 39 inches.

This unit is 35 percent Chaix sandy loam, 35 percent Rock outcrop, and 25 percent Chawanakee coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix

Rock outcrop

Chawanakee

Depth

20 to 40 in

8 to 20 in

Available Water Capacity

Low

Low to very low

Total

3 to 4 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Somewhat excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

Very high

Erosion Factor (K)

0.24

0.28

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

3Ep

4ED

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, d, and f, very steep slopes, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, very steep slopes, rock outcrop

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Dome and Holland soils. Included areas make up about 5 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used mainly as limited rangeland in summer. It is also used for limited timber production.

621 Dome-Chaix-Rock outcrop association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. Slope is 5 to 30 percent. The native plant communities are Yellow Pine Forest and Mixed Conifer Forest. Elevation is 5,710 to 8,040 feet. The average annual precipitation is about 20 to 30 inches.

This unit is 45 percent Dome sandy loam, 20 percent Chaix sandy loam, and 20 percent Rock outcrop.

Soil Map Unit Components

| | | | |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--|
| Depth | 40 to 60 in | 20 to 40 in | |
| Available Water Capacity | Moderate to low | Low | |
| Total | 5 to 6 in | 3 to 4 in | |
| Upper 20" | 2 in | 2 in | |
| Permeability | Moderately rapid | Moderately rapid | |
| Hydrologic Soil Group | B | B | |
| Drainage Class | Well drained | Well drained or somewhat excessively drained | |
| Runoff | Rapid | Rapid | |
| Max Erosion Hazard | Moderate | Moderate | |
| Erosion Factor (K) | 0.20 | 0.24 | |
| Unified Soil Class | SM | SM | |
| Soil & Rock Color | Intermediate | Intermediate | |
| Soil Manageability Class | 2ep | 3eP | |
| Timber Production | | | |
| CMAI (cu ft/acre) | 85 to 164 | 50 to 84 | |
| Suitability | Suitable | Suitable | |
| Limiting Factors | Regeneration difficulty—d and f | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | II | II | |
| Included Areas & Remarks | Included in this unit are small areas of Holland soils, Chawanakee soils, and Junipero family soils. Included areas make up about 15 percent of the total acreage. | | |

Dome

Chaix

Rock outcrop

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

622 Dome-Chaix-Rock outcrop association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest and Mixed Conifer Forest. Elevation is 5,000 to 8,040 feet. The average annual precipitation is about 24 to 51 inches.

This unit is 35 percent Dome sandy loam, 30 percent Chaix sandy loam, and 20 percent Rock outcrop.

Soil Map Unit Components

Dome Chaix Rock outcrop

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate to low

Low

Total

5 to 6 in

3 to 4 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat
excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ep

3eP

Timber Production

CMAI (cu ft/acre)

85 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Chawanakee soils and Junipero family soils. Included areas make up about 15 percent of the total acreage.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The subsoil is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

624 Sirretta-Rock outcrop-Cannell complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest dominated by Jeffrey pine, White Fir Forest, and Montane Chaparral. Elevation is 6,990 to 8,790 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 30 percent Sirretta gravelly coarse sandy loam, 30 percent Rock outcrop, and 20 percent Cannell sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Sirretta

Rock outcrop

Cannell

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Very low

Moderate

Total

1 to 2 in

5 to 7 in

Upper 20"

1 in

2 in

Permeability

Rapid

Moderately rapid

Hydrologic Soil Group

A

B

Drainage Class

Excessively drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.17

0.20

Unified Soil Class

GM/SW

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

4ePX

2ep

Timber Production

CMAI (cu ft/acre)

20 to 49

85 to 119

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—b, d, and e

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

rock outcrop, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Nanny family soils, Dome soils, and Chaix soils. Included areas make up about 20 percent of the total acreage.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The subsoil is brown and light yellowish brown gravelly loamy sand about 22 inches thick over fractured granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

625 Sirretta-Rock outcrop-Nanny family complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest dominated by Jeffrey pine, White Fir Forest, and Montane Chaparral. Elevation is 7,220 to 8,400 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 30 percent Sirretta gravelly coarse sandy loam, 30 percent Rock outcrop, and 20 percent Nanny family sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Sirretta

Rock outcrop

Nanny family

Depth

20 to 40 in

60+ in

Available Water Capacity

Very low

Moderate to low

Total

1 to 2 in

4 to 6 in

Upper 20"

.5 in

2 in

Permeability

Rapid

Moderately rapid

Hydrologic Soil Group

A

B

Drainage Class

Excessively drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.17

0.29

Unified Soil Class

GM/SW

SM/GM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

4ePX

2e

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—b, d, and e

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, steep slopes, plant competition

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Cannell, Dome, and Chaix soils. Included areas make up about 20 percent of the total acreage.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The subsoil is brown and light yellowish brown gravelly loamy sand about 22 inches thick over fractured granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy fine sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

628 Nanny family-Toem complex, 30 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest, White Fir Forest, and Lodgepole Pine Forest. Elevation is 8,010 to 8,760 feet. The average annual precipitation is about 14 to 20 inches.

This unit is 65 percent Nanny family sandy loam and 25 percent Toem loamy sand. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Nanny family

Toem

Depth

60+ in

4 to 20 in

Available Water Capacity

Moderate to low

Very low

Total

4 to 6 in

1 to 2 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Rapid

Hydrologic Soil Group

B

D

Drainage Class

Well drained

Excessively drained

Runoff

Slow

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.29

0.32

Unified Soil Class

SM/GM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3Ep

3Ed

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, b, d, and e, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Steep slopes, shallow soils, plant competition

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Nanny family soil is deep and formed in residuum derived from granitic rock. This soil is 35 to 80 percent gravel and cobbles. Typically, the surface layer is very dark grayish brown sandy loam about 6 inches thick. The subsoil is brown and pale brown sandy loam and extremely gravelly fine sandy loam about 23 inches thick. The substratum is yellowish brown loamy fine sand and very gravelly loamy fine sand about 46 inches thick over highly weathered granitic rock.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

631 Chesaw family-Toem-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Sagebrush Scrub, Foxtail-Limber Pine Forest, Red Fir Forest, Lodgepole Pine Forest, and Montane Chaparral. Elevation is 7,780 to 9,190 feet. The average annual precipitation is about 12 to 18 inches.

This unit is 50 percent Chesaw family extremely cobbly loamy coarse sand, 30 percent Toem loamy sand, and 10 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chesaw family Toem Rock outcrop

Depth
Available Water Capacity
 Total
 Upper 20"
Permeability
Hydrologic Soil Group
Drainage Class
Runoff
Max Erosion Hazard
Erosion Factor (K)
Unified Soil Class
Soil & Rock Color
Soil Manageability
Class
Timber Production
 CMAI (cu ft/acre)
 Suitability
 Limiting Factors
Range Production
 Seasons of Use
 Limiting Factors
Soil Manageability
Group
Included Areas &
Remarks

| | | |
|------------------------------------------------|---------------------|--|
| 20 to 30 in | 4 to 20 in | |
| Very low | Very low | |
| 1 to 2 in | 1 to 2 in | |
| 1 in | 2 in | |
| Rapid | Rapid | |
| A | D | |
| Excessively drained | Excessively drained | |
| Slow | Very rapid | |
| High | High | |
| 0.17 | 0.32 | |
| SM/GM-GP | SM | |
| Intermediate | Intermediate | |
| 4EPX | 3Ed | |
| 20-49 | 20-49 | |
| Poorly suited | Poorly suited | |
| Summer | Summer | |
| Shallow soils, steep slopes, plant competition | | |
| IV | IV | |

Included in this unit are small areas of Nanny family soils and Cagwin soils. Included areas make up about 10 percent of the total acreage.

The Chesaw family soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 60 percent gravel and cobbles. Typically, the surface layer is brown extremely cobbly loamy coarse sand about 16 inches thick. The substratum is dark yellowish brown very stony loamy coarse sand about 14 inches thick over highly weathered granitic rock.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark brown loamy sand about 3 inches thick. The subsoil is brown loamy sand about 16 inches thick over highly weathered granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used as limited rangeland in summer.

635 Hotaw Variant-Brownlee family-Rock outcrop complex, 40 to 75 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,000 to 7,200 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 40 percent Hotaw Variant loam, 30 percent Brownlee family very fine sandy loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit
Components

Hotaw variant

Brownlee family

Rock outcrop

Depth

20 to 30 in

60+ in

Available Water Capacity

Low

Moderate

Total

3 to 5 in

5 to 9 in

Upper 20"

3 in

3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid to very rapid

Rapid to very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.37

0.32

Unified Soil Class

ML/CL

ML/CL

Soil & Rock Color

Low

Low

Soil Manageability
Class

4G

4G

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 119

Suitability

Suitable

Suitable

Limiting Factors

Very steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Steep and very steep slopes, plant competition

Soil Manageability
Group

IV

IV

Included Areas &
Remarks

Included in this unit are small areas of Shaver soils, Holland soils, and Chualar family soils. Included areas make up about 10 percent of the total acreage.

The Hotaw Variant soil is moderately deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is dark brown gravelly loam and gravelly clay loam about 23 inches thick over fractured metasedimentary rock.

The Brownlee family soil is deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is brown very fine sandy loam and loam about 15 inches thick. The subsoil is yellowish brown and brownish yellow sandy clay loam about 51 inches thick over weathered metamorphic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of metasedimentary or metamorphic rock

This unit is used for timber production and as limited rangeland in summer.

638 Sirretta-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Red Fir Forest, Lodgepole Pine Forest, and Montane Chaparral. Elevation is 8,400 to 10,600 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 55 percent Sirretta soils and 35 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Sirretta

Rock outcrop

Depth

20 to 40 in

Available Water Capacity

Very low

Total

1 to 2 in

Upper 20"

1 in

Permeability

Rapid

Hydrologic Soil Group

A

Drainage Class

Excessively drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.17

Unified Soil Class

GM/SW

Soil & Rock Color

Intermediate

Soil Manageability Class

4EPX

Timber Production

CMAI (cu ft/acre)

20 to 49

Suitability

Poorly suited

Limiting Factors

Regeneration difficulty—b, d, and e, steep slopes, very high erosion hazard

Range Production

Seasons of Use

Summer

Limiting Factors

Rock outcrop, very steep slopes, plant competition, very high erosion hazard

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Toem and Cagwin soils. Included areas make up about 10 percent of the total acreage.

The Sirretta soil is moderately deep and formed in residuum derived from granitic rock. This soil is 35 to 90 percent gravel and cobbles. Typically, the surface layer is dark grayish brown gravelly coarse sandy loam about 6 inches thick. The subsoil is brown and light yellowish brown gravelly loamy sand about 22 inches thick over fractured granitic rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly as limited rangeland in summer. It is also used for timber production.

639 Cagwin-Toem-Monache association, 5 to 30 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and in upland basins. Slope is 5 to 30 percent. The native plant communities are Red Fir Forest, Lodgepole Pine Forest, and Montane Meadow. Elevation is 8,010 to 8,990 feet. The average annual precipitation is about 16 to 20 inches.

This unit is 45 percent Cagwin loamy sand, 35 percent Toem loamy sand, and 10 percent Monache very fine sandy loam.

Soil Map Unit
Components

Cagwin

Toem

Monache

Depth

20 to 40 in

4 to 20 in

60+ in

Available Water Capacity

Very low

Very low

Moderate

Total

1 to 2 in

1 to 2 in

6 to 8 in

Upper 20"

1 in

2 in

3 in

Permeability

Rapid

Rapid

Moderate

Hydrologic Soil Group

A

D

B

Drainage Class

Somewhat excessively drained

Excessively drained

Moderately well drained

Runoff

Medium to rapid

Medium to rapid

Medium

Max Erosion Hazard

Moderate

Moderate

Moderate

Erosion Factor (K)

0.29

0.32

0.32

Unified Soil Class

SM

SM

ML/SM

Soil & Rock Color

Intermediate

Intermediate

Intermediate

Soil Manageability
Class

2ep

2ed

2e

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

—

Suitability

Poorly suited

Poorly suited

Unsuitable

Limiting Factors

Regeneration difficulty—a and d

Range Production

Seasons of Use

Summer

Summer

Summer

Limiting Factors

Plant competition, shallow soils

Soil Manageability
Group

II

II

II

Included Areas &
Remarks

Included in this unit are small areas of Cannell soils and Monache Variant soil, drained. Included areas make up about 10 percent of the total acreage.

The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand about 21 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loamy coarse sand.

The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.

The Monache soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is grayish brown very fine sandy loam about 23 inches thick. The substratum to a depth of 60 inches or more is brown loam and gravelly sandy loam and is mottled. In some areas the surface layer is loam or fine sandy loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

640 Cagwin-Toem-Monache association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and in upland basins. Slope is 30 to 50 percent. The native plant communities are Red Fir Forest, Lodgepole Pine Forest, and Montane Meadow. Elevation is 8,010 to 8,990 feet. The average annual precipitation is about 16 to 20 inches.

This unit is 45 percent Cagwin loamy sand, 35 percent Toem loamy sand, and 10 percent Monache very fine sandy loam.

Soil Map Unit Components

| | Cagwin | Toem | Monache |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------|
| Depth | 20 to 40 in | 4 to 20 in | 60+ in |
| Available Water Capacity | Very low | Very low | Moderate |
| Total | 1 to 2 in | 1 to 2 in | 6 to 8 in |
| Upper 20" | 1 in | 2 in | 3 in |
| Permeability | Rapid | Rapid | Moderate |
| Hydrologic Soil Group | A | D | B |
| Drainage Class | Somewhat excessively drained | Excessively drained | Moderately well drained |
| Runoff | Rapid | Rapid | Rapid |
| Max Erosion Hazard | High | High | High |
| Erosion Factor (K) | 0.29 | 0.32 | 0.32 |
| Unified Soil Class | SM | SM | ML/SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 3Ep | 3Ed | 2E |
| Timber Production | | | |
| CMAI (cu ft/acre) | 50 to 84 | 20 to 49 | — |
| Suitability | Poorly suited | Poorly suited | Unsuitable |
| Limiting Factors | Regeneration difficulty—a and d, high erosion hazard | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition, steep slopes, shallow soils | | |
| Soil Manageability Group | III | III | III |
| Included Areas & Remarks | <p>Included in this unit are small areas of Cannell soils and Monache Variant soils, drained. Included areas make up about 10 percent of the total acreage.</p> <p>The Cagwin soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loamy sand about 13 inches thick. The substratum is pale brown loamy coarse sand 21 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loamy coarse sand.</p> <p>The Toem soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is dark grayish brown loamy sand about 3 inches thick. The substratum is brown loamy sand about 16 inches thick over highly weathered granitic rock.</p> <p>The Monache soil is deep and formed in alluvium derived dominantly from granitic rock. Typically, the surface layer is grayish brown very fine sandy loam about 23 inches thick. The substratum to a depth of 120 inches or more is brown loam and gravelly sandy loam and is mottled. In some areas the surface layer is loam or fine sandy loam.</p> <p>The water table fluctuates between depths of 36 and 71 inches.</p> <p>This unit is used mainly for timber production. It is also used as limited rangeland in summer.</p> | | |

643 Glean Variant extremely gravelly fine sandy loam, 20 to 60 percent slopes.

| | |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physiographic Location, Elevation, and Precipitation | This moderately deep soil is on mountainsides and ridges. It formed in residuum derived dominantly from andesite. The native plant communities are Yellow Pine Forest, Lodgepole Pine Forest, and Sagebrush Scrub. Elevation is 7,600 to 9,910 feet. The average annual precipitation is about 20 to 30 inches. |
| Soil Map Unit Components | Glean variant |
| Depth | 20 to 40 in |
| Available Water Capacity | Low |
| Total | 2 to 3 in |
| Upper 20" | 1 in |
| Permeability | Moderately rapid |
| Hydrologic Soil Group | B |
| Drainage Class | Somewhat excessively drained |
| Runoff | Medium to very rapid |
| Max Erosion Hazard | High |
| Erosion Factor (K) | 0.20 |
| Unified Soil Class | GM |
| Soil & Rock Color | Intermediate |
| Soil Manageability Class | 4EP |
| Timber Production | |
| CMAI (cu ft/acre) | 20 to 49 |
| Suitability | Poorly suited |
| Limiting Factors | Regeneration difficulty—d, high erosion hazard |
| Range Production | |
| Seasons of Use | Summer |
| Limiting Factors | Plant competition, steep slopes |
| Soil Manageability Group | IV |
| Included Areas & Remarks | Included in this unit are small areas of Rock outcrop. Typically, the surface layer is brown extremely gravelly fine sandy loam about 12 inches thick. The substratum is light brownish gray and pale brown extremely gravelly sandy loam about 25 inches thick over highly fractured andesite. This soil is 50 to 80 percent gravel and cobbles. |

This unit is used mainly for timber production. It is also used as rangeland in summer.

645 Cannell-Kriest family-Rock outcrop complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and White Fir Forest. Elevation is 6,560 to 8,400 feet. The average annual precipitation is about 30 to 49 inches.

This unit is 55 percent Cannell sandy loam, 20 percent Kriest family sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Cannell Kriest family Rock outcrop

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate

Low

Total

5 to 7 in

3 to 4 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderate

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ep

2ep

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—b and d

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, rock outcrop

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Toem soils. Included areas make up about 10 percent of the total acreage.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Kriest family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsoil is pale brown sandy loam about 17 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

646 Cannell-Kriest family-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and White Fir Forest. Elevation is 6,560 to 8,990 feet. The average annual precipitation is about 30 to 49 inches.

This unit is 55 percent Cannell sandy loam, 20 percent Kriest family sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Cannell

Kriest family

Rock outcrop

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate

Low

Total

5 to 7 in

3 to 4 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderate

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3ep

3Ep

Timber Production

CMAI (cu ft/acre)

85 to 110

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—b and d, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes, rock outcrop

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Toem soils. Included areas make up about 10 percent of the total acreage.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Kriest family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsoil is pale brown sandy loam about 27 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

647 Cannell-Kriest family-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest and White Fir Forest. Elevation is 6,560 to 8,790 feet. The average annual precipitation is about 30 to 49 inches.

This unit is 55 percent Cannell sandy loam, 20 percent Kriest family sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

| Cannell | Kriest family | Rock outcrop |
|---------|---------------|--------------|
|---------|---------------|--------------|

Depth

| | | |
|-------------|-------------|--|
| 40 to 60 in | 20 to 40 in | |
|-------------|-------------|--|

Available Water Capacity Total Upper 20"

| | | |
|-------------------------------|--------------------------|--|
| Moderate 5 to 7 in 2 in | Low 3 to 4 in 2 in | |
|-------------------------------|--------------------------|--|

Permeability

| | | |
|------------------|----------|--|
| Moderately rapid | Moderate | |
|------------------|----------|--|

Hydrologic Soil Group

| | | |
|---|---|--|
| B | B | |
|---|---|--|

Drainage Class

| | | |
|--------------|--------------|--|
| Well drained | Well drained | |
|--------------|--------------|--|

Runoff

| | | |
|------------|------------|--|
| Very rapid | Very rapid | |
|------------|------------|--|

Max Erosion Hazard

| | | |
|-----------|-----------|--|
| Very high | Very high | |
|-----------|-----------|--|

Erosion Factor (K)

| | | |
|------|------|--|
| 0.20 | 0.24 | |
|------|------|--|

Unified Soil Class

| | | |
|----|----|--|
| SM | SM | |
|----|----|--|

Soil & Rock Color

| | | |
|--------------|--------------|--|
| Intermediate | Intermediate | |
|--------------|--------------|--|

Soil Manageability Class

| | | |
|-----|-----|--|
| 3Gp | 3Gp | |
|-----|-----|--|

Timber Production

CMAI (cu ft/acre)

| | | |
|-----------|----------|--|
| 85 to 110 | 50 to 84 | |
|-----------|----------|--|

Suitability

| | | |
|----------|----------|--|
| Suitable | Suitable | |
|----------|----------|--|

Limiting Factors

| | | |
|------------------------------------------------------------------------------|--|--|
| Very steep slopes, regeneration difficulty—b and d, very high erosion hazard | | |
|------------------------------------------------------------------------------|--|--|

Range Production

Seasons of Use

| | | |
|--------|--------|--|
| Summer | Summer | |
|--------|--------|--|

Limiting Factors

| | | |
|----------------------------------------------------|--|--|
| Very steep slopes, plant competition, rock outcrop | | |
|----------------------------------------------------|--|--|

Soil Manageability Group

| | | |
|----|----|--|
| IV | IV | |
|----|----|--|

Included Areas & Remarks

Included in this unit are small areas of Toem soils. Included areas make up about 10 percent of the total acreage.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Kriest family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 5 inches thick. The subsoil is pale brown sandy loam about 27 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

648 Kriest family-Cannell-Rock outcrop complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Red Fir Forest, White Fir Forest, and Montane Chaparral. Elevation is 6,990 to 8,010 feet. The average annual precipitation is about 39 to 51 inches.

This unit is 50 percent Kriest family sandy loam, 20 percent Cannell sandy loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Kriest family Cannell Rock outcrop

Depth Available Water Capacity Total Upper 20"

| | |
|-------------|-------------|
| 20 to 40 in | 40 to 60 in |
| Low | Moderate |
| 3 to 4 in | 5 to 7 in |
| 2 in | 2 in |

Permeability

| | |
|----------|------------------|
| Moderate | Moderately rapid |
|----------|------------------|

Hydrologic Soil Group

| | |
|---|---|
| B | B |
|---|---|

Drainage Class

| | |
|--------------|--------------|
| Well drained | Well drained |
|--------------|--------------|

Runoff

| | |
|-----------------|-----------------|
| Medium to rapid | Medium to rapid |
|-----------------|-----------------|

Max Erosion Hazard

| | |
|----------|----------|
| Moderate | Moderate |
|----------|----------|

Erosion Factor (K)

| | |
|------|------|
| 0.24 | 0.20 |
|------|------|

Unified Soil Class

| | |
|----|----|
| SM | SM |
|----|----|

Soil & Rock Color

| | |
|--------------|--------------|
| Intermediate | Intermediate |
|--------------|--------------|

Soil Manageability Class

| | |
|-----|-----|
| 2ep | 2ep |
|-----|-----|

Timber Production

CMAI (cu ft/acre)

| | |
|-----------|----------|
| 85 to 110 | 50 to 84 |
|-----------|----------|

Suitability

| | |
|----------|----------|
| Suitable | Suitable |
|----------|----------|

Limiting Factors

| | |
|---------------------------------|--|
| Regeneration difficulty—b and d | |
|---------------------------------|--|

Range Production

Seasons of Use

| | |
|--------|--------|
| Summer | Summer |
|--------|--------|

Limiting Factors

| | |
|-------------------|--|
| Plant competition | |
|-------------------|--|

Soil Manageability Group

| | |
|----|----|
| II | II |
|----|----|

Included Areas & Remarks

Included in this unit are small areas of Toem soils. Included areas make up about 10 percent of the total acreage.

The Kriest family soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 6 inches thick. The subsoil is pale brown sandy loam about 27 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Cannell soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is yellowish brown sandy loam about 20 inches thick. The substratum is yellowish brown sandy loam about 23 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

651 Shaver-Holland association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 5 to 30 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,000 to 5,590 feet. The average annual precipitation is about 30 to 51 inches.

This unit is 50 percent Shaver fine sandy loam and 40 percent Holland sandy loam.

Soil Map Unit Components

Shaver

Holland

Depth
Available Water Capacity
Total
Upper 20"

40 to 60 in
Moderate
6 to 9 in
3 in

60+ in
Moderate to high
7 to 10 in
3 in

Permeability

Moderately rapid

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Medium

Medium or rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.24

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

2e

2e

Timber Production

CMAI (cu ft/acre)

85 to 119

120 to 169

Suitability

Suitable

Suitable

Limiting Factors

No prominent limitations

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability
Group

II

II

Included Areas &
Remarks

Included in this unit are small areas of Hotaw soils, Chaix soils, and Rock outcrop. Included areas make up about 10 percent of the total acreage.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

655 Wind River family-Shaver association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,690 to 6,790 feet. The average annual precipitation is about 39 to 51 inches.

This unit is 55 percent Wind River family loam and 30 percent Shaver fine sandy loam.

Soil Map Unit Components

Wind River family

Shaver

Depth

40 to 60+ in

40 to 60 in

Available Water Capacity

Moderate to low

Moderate

Total

4 to 6 in

6 to 9 in

Upper 20"

3 in

3 in

Permeability

Moderate

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or moderately well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

ML/SC

SM

Soil & Rock Color

Low

Low

Soil Manageability Class

3e

3E

Timber Production

CMAI (cu ft/acre)

85 to 119

85 to 119

Suitability

Suitable

Suitable

Limiting Factors

Steep slopes

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Holland soils and Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, and granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 20 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

657 Chaix-Dome-Holland association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. Slope is 5 to 30 percent. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 4,920 to 7,220 feet. The average annual precipitation is about 35 to 51 inches.

This unit is 40 percent Chaix sandy loam, 30 percent Dome sandy loam, and 20 percent Holland sandy loam.

Soil Map Unit Components

Depth

20 to 40 in

40 to 60 in

60+ in

Available Water Capacity Total Upper 20"

Low

Moderate to low

Moderate to high

3 to 4 in

5 to 6 in

7 to 10 in

2 in

2 in

3 in

Permeability

Moderately rapid

Moderately rapid

Moderately slow

Hydrologic Soil Group

B

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Moderate

Erosion Factor (K)

0.24

0.20

0.20

Unified Soil Class

SM

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Intermediate

Soil Manageability Class

2ep

2ep

2ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

120 to 164

Suitability

Suitable

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

II

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop and Chawanakee soils. Included areas make up about 10 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

658 Chaix-Dome-Holland association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 4,790 to 7,220 feet. The average annual precipitation is about 30 to 39 inches.

This is 40 percent Chaix sandy loam, 30 percent Dome sandy loam, and 20 percent Holland sandy loam.

Soil Map Unit Components

| | Chaix | Dome | Holland |
|-----------------------------|------------------------------------------------------|------------------|------------------|
| Depth | 20 to 40 in | 40 to 60 in | 60+ in |
| Available Water Capacity | Low | Moderate | Moderate to high |
| Total | 3 to 4 in | 5 to 6 in | 7 to 10 in |
| Upper 20" | 2 in | 2 in | 3 in |
| Permeability | Moderately rapid | Moderately rapid | Moderately slow |
| Hydrologic Soil Group | B | B | B |
| Drainage Class | Well drained or somewhat excessively drained | Well drained | Well drained |
| Runoff | Rapid | Rapid | Rapid |
| Max Erosion Hazard | High | High | High |
| Erosion Factor (K) | 0.24 | 0.20 | 0.20 |
| Unified Soil Class | SM | SM | SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 3Ep | 3Ep | 3Ep |
| Timber Production | | | |
| CMAI (cu ft/acre) | 50 to 84 | 85 to 164 | 120 to 164 |
| Suitability | Suitable | Suitable | Suitable |
| Limiting Factors | regeneration difficulty—d and f, high erosion hazard | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition, steep slopes | | |
| Soil Manageability Group | III | III | III |

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop and Chawanakee soils. Included areas make up about 10 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

660 Shaver-Chaix association, 2 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 2 to 30 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 5,000 to 6,790 feet. The average annual precipitation is about 20 to 51 inches.

This unit is 60 percent Shaver fine sandy loam and 25 percent Chaix sandy loam.

Soil Map Unit Components

Shaver

Chaix

Depth
Available Water Capacity
Total
Upper 20"

40 to 60 in
Moderate
6 to 9 in
3 in

20 to 40 in
Low
3 to 4 in
2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat excessively drained

Runoff

Slow to medium

Slow to medium

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.24

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Low

Low

Soil Manageability
Class

2e

2ep

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability
Group

II

II

Included Areas &
Remarks

Included in this unit are small areas of Monache Variant soils, drained, warm; Holland and Chawanakee soils; and Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

661 Shaver-Chaix association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,530 to 7,600 feet. The average annual precipitation is about 20 to 51 inches.

This unit is 50 percent Shaver fine sandy loam and 35 percent Chaix sandy loam.

Soil Map Unit Components

Shaver

Chaix

Depth Available Water Capacity Total Upper 20"

40 to 60 in

20 to 40 in

Permeability

Moderate

Low

Hydrologic Soil Group

6 to 9 in

3 to 4 in

Drainage Class

3 in

2 in

Runoff

Moderately rapid

Moderately rapid

Max Erosion Hazard

B

B

Erosion Factor (K)

Well drained

Well drained or somewhat excessively drained

Unified Soil Class

Rapid

Rapid

Soil & Rock Color

High

High

Soil Manageability Class

0.24

0.24

Timber Production

SM

SM

Limiting Factors

Intermediate

Intermediate

Range Production

3E

3Ep

Seasons of Use Limiting Factors

85 to 119

50 to 84

Suitable

Suitable

Regeneration difficulty—d and f, high erosion hazard

Soil Manageability Group

Summer

Summer

Plant competition, steep slopes

III

III

Included Areas & Remarks

Included in this unit are small areas of Monache Variant soils, drained, warm; Holland and Chawanakee soils; and Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

662 Shaver-Chaix association, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 50 to 75 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,530 to 6,910 feet. The average annual precipitation is about 30 to 51 inches.

This unit is 50 percent Shaver fine sandy loam and 30 percent Chaix sandy loam.

Soil Map Unit Components

Shaver

Chaix

Depth Available Water Capacity Total Upper 20"

40 to 60 in

20 to 40 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3G

3G

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Very steep slopes, regeneration difficulty—d and f, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Monache Variant soils, drained, warm; Holland and Chawanakee soils; and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

663 Chawanakee-Rock outcrop-Chaix complex, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir Forest. Elevation is 4,500 to 6,560 feet. The average annual precipitation is about 26 to 39 inches.

This unit is 40 percent Chawanakee coarse sandy loam, 30 percent Rock outcrop, and 15 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chawanakee

Rock outcrop

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively drained

Well drained or somewhat
excessively drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Moderate

Moderate

Soil Manageability Class

4ED

2Ep

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a and d, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, shallow soils, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome and Woolstalf soils. Included areas make up about 15 percent of the total acreage.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used for timber production and as rangeland in summer.

664 Chawanakee-Rock outcrop-Chaix complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Montane Chaparral, Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 4,790 to 8,040 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 40 percent Chawanakee coarse sandy loam, 30 percent Rock outcrop, and 15 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chawanakee

Rock outcrop

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively drained

Well drained or somewhat
excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4ED

3Ep

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a and d, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Steep slopes, rock outcrop, shallow soils, plant competition, very high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome and Woolstalf soils. Included areas make up about 15 percent of the total acreage.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used for limited timber production and as limited rangeland in summer.

665 Chawanakee-Rock outcrop-Chaix complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir Forest. Elevation is 3,940 to 8,040 feet. The average annual precipitation is about 20 to 49 inches.

This unit is 40 percent Chawanakee coarse sandy loam, 40 percent Rock outcrop, and 10 percent Chaix sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chawanakee

Rock outcrop

Chaix

Depth

8 to 20 in

20 to 40 in

Available Water Capacity

Very low

Low

Total

1 to 2 in

3 to 4 in

Upper 20"

1 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

C

B

Drainage Class

Somewhat excessively drained

Well drained or somewhat
excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.28

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

High

High

Soil Manageability Class

4GD

3Gp

Timber Production

CMAI (cu ft/acre)

20 to 49

50 to 84

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a and d, very steep slopes, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Very steep slopes, rock outcrop, shallow soils, plant competition, very high erosion hazard

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Dome, Shaver, and Woolstalf soils. Included areas make up about 15 percent of the total acreage.

The Chawanakee soil is shallow and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown coarse sandy loam about 3 inches thick. The subsoil is yellowish brown sandy loam about 7 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used for limited timber production.

666 Wind River family-Rock outcrop association, 15 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 15 to 30 percent. The native plant community is Yellow Pine Forest. Elevation is 6,000 to 7,550 feet. The average annual precipitation is about 20 to 24 inches.

This unit is 70 percent Wind River family loam and 10 percent Rock outcrop.

Soil Map Unit Components

Wind River family

Rock outcrop

Depth

40 to 60+ in

Available Water Capacity

Moderate to low

Total

4 to 6 in

Upper 20"

3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained or moderately well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.20

Unified Soil Class

ML/SC

Soil & Rock Color

Low

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

85 to 119

Suitability

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Woolstalf, Baldmountain, Toem, and Cagwin soils. Included areas make up about 20 percent of the total acreage.

The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, or granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 20 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of metasedimentary or granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

667 Wind River family-Rock outcrop association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 30 to 50 percent. The native plant community is Yellow Pine Forest. Elevation is 5,000 to 6,400 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 60 percent Wind River family loam and 20 percent Rock outcrop.

Soil Map Unit Components

Wind River family

Rock outcrop

Depth

40 to 60+ in

Available Water Capacity

Moderate to low

Total

4 to 6 in

Upper 20"

3 in

Permeability

Moderate

Hydrologic Soil Group

B

Drainage Class

Well drained or moderately well drained

Runoff

Rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.20

Unified Soil Class

ML/SC

Soil & Rock Color

Low

Soil Manageability Class

2e

Timber Production

CMAI (cu ft/acre)

85 to 119

Suitability

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Woolstalf, Baldmountain, Toem, and Cagwin soils. Included areas make up about 20 percent of the total acreage.

The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, or granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 20 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures predominantly of metasedimentary and granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

670 Chaix-Dome-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 5,000 to 8,040 feet. The average annual precipitation is about 30 to 51 inches.

This unit is 45 percent Chaix sandy loam, 25 percent Dome sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix Dome Rock outcrop

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Low

Moderate to low

Total

3 to 4 in

5 to 6 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Chawanakee and Holland soils. Included areas make up about 15 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

671 Chaix-Dome-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 5,000 to 8,040 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 45 percent Chaix sandy loam, 25 percent Dome sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix

Dome

Rock outcrop

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Low

Moderate to low

Total

3 to 4 in

5 to 6 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

High

Erosion Factor (K)

0.24

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

Suitability

Suitable

Suitable

Limiting Factors

Very steep slopes, regeneration difficulty—d and f, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Very steep slopes, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chawanakee and Holland soils. Included areas make up about 15 percent of the total acreage.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly as timber production. It is also used for limited rangeland in summer.

672 Dome-Chaix association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. Slope is 5 to 30 percent. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 5,000 to 8,040 feet. The average annual precipitation is about 30 to 51 inches.

This unit is 45 percent Dome sandy loam and 25 percent Chaix sandy loam.

Soil Map Unit Components

Dome

Chaix

Depth
Available Water Capacity
Total
Upper 20"

40 to 60 in
Moderate to low
5 to 6 in
2 in

20 to 40 in
Low
3 to 4 in
2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat excessively drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

2ep

2ep

Timber Production

CMAI (cu ft/acre)

85 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability
Group

II

II

Included Areas &
Remarks

Included in this unit are small areas of Chawanakee soils, Rock outcrop, and Woolstalf soils. Included areas make up about 30 percent of the total acreage.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as rangeland in summer.

673 Dome-Chaix association, 30 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 5,000 to 7,420 feet. The average annual precipitation is about 30 to 51 inches.

This unit is 45 percent Dome sandy loam and 25 percent Chaix sandy loam.

Soil Map Unit
Components

Dome

Chaix

Depth
Available Water Capacity
Total
Upper 20"

40 to 60 in
Moderate to low
5 to 6 in
2 in

20 to 40 in
Low
3 to 4 in
2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)
Suitability
Limiting Factors

85 to 164
Suitable
Regeneration difficulty—d and f, high erosion hazard

50 to 84
Suitable

Range Production

Seasons of Use
Limiting Factors

Summer
Plant competition, steep slopes

Summer

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of Chawanakee soils, Rock outcrop, and Woolstalf soils. Included areas make up about 30 percent of the total acreage.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

674 Dome-Chaix association, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides and ridges. Slope is 50 to 75 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 5,180 to 6,790 feet. The average annual precipitation is about 45 to 51 inches.

This unit is 45 percent Dome sandy loam and 25 percent Chaix sandy loam.

Soil Map Unit Components

Dome

Chaix

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate to low

Low

Total

5 to 6 in

3 to 4 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained or somewhat excessively drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)

85 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f, very steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chawanakee soils, Rock outcrop, and Woolstalf soils. Included areas make up about 30 percent of the total acreage.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 17 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

675 Woolstalf-Rock outcrop complex, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 6,000 to 7,550 feet. The average annual precipitation is about 20 to 24 inches.

This unit is 50 percent Woolstalf gravelly fine sandy loam and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Woolstalf

Rock outcrop

Depth

40 to 60 in

Available Water Capacity

Moderate to low

Total

5 to 6 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Medium to rapid

Max Erosion Hazard

Moderate

Erosion Factor (K)

0.24

Unified Soil Class

SM/GM

Soil & Rock Color

Intermediate

Soil Manageability Class

2ep

Timber Production

CMAI (cu ft/acre)

85 to 119

Suitability

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

Included Areas & Remarks

Included in this unit are small areas of Baldmountain, Dome, and Chaix soils. Included areas make up about 20 percent of the total acreage.

The Woolstalf soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 75 percent gravel and cobbles. Typically, the surface layer is dark brown and brown, gravelly and very gravelly fine sandy loam about 37 inches thick. The subsoil is yellowish brown extremely gravelly fine sandy loam about 22 inches thick over weathered metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures dominantly of metasedimentary rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

676 Woolstalf-Rock outcrop complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 6,000 to 7,550 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 50 percent Woolstalf gravelly fine sandy loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Woolstalf

Rock outcrop

Depth

40 to 60 in

Available Water Capacity

Moderate to low

Total

5 to 6 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Rapid

Max Erosion Hazard

High

Erosion Factor (K)

0.24

Unified Soil Class

SM/GM

Soil & Rock Color

Intermediate

Soil Manageability Class

3Ep

Timber Production

CMAI (cu ft/acre)

85 to 119

Suitability

Suitable

Limiting Factors

Regeneration difficulty—high erosion hazard

Range Production

Seasons of Use

Summer

Limiting Factors

Plant competition, rock outcrop, steep slopes

Soil Manageability Group

III

Included Areas & Remarks

Included in this unit are small areas of Baldmountain, Dome, and Chaix soils. Included areas make up about 20 percent of the total acreage.

The Woolstalf soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 75 percent gravel and cobbles. Typically, the surface layer is dark brown and brown, gravelly and very gravelly fine sandy loam about 37 inches thick. The subsoil is yellowish brown extremely gravelly fine sandy loam about 22 inches thick over weathered metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures dominantly of metasedimentary rock.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

677 Woolstalf-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Yellow Pine Forest and Montane Chaparral. Elevation is 5,090 to 7,550 feet. The average annual precipitation is about 20 to 35 inches.

This unit is 50 percent Woolstalf gravelly fine sandy loam and 35 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Woolstalf

Rock outcrop

Depth

40 to 60 in

Available Water Capacity

Moderate to low

Total

5 to 6 in

Upper 20"

2 in

Permeability

Moderately rapid

Hydrologic Soil Group

B

Drainage Class

Well drained

Runoff

Very rapid

Max Erosion Hazard

Very high

Erosion Factor (K)

0.24

Unified Soil Class

SM/GM

Soil & Rock Color

Intermediate

Soil Manageability Class

3Ep

Timber Production

CMAI (cu ft/acre)

85 to 119

Suitability

Suitable

Limiting Factors

Regeneration difficulty—d and e, very steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Limiting Factors

Plant competition, rock outcrop, very steep slopes

Soil Manageability Group

IV

Included Areas & Remarks

Included in this unit are small areas of Baldmountain, Dome, and Chaix soils. Included areas make up about 15 percent of the total acreage.

The Woolstalf soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 75 percent gravel and cobbles. Typically, the surface layer is dark brown and brown, gravelly and very gravelly fine sandy loam about 37 inches thick. The subsoil is yellowish brown extremely gravelly fine sandy loam about 22 inches thick over weathered metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures dominantly of metasedimentary rock.

This unit is used for timber production.

679 Woolstalf-Hotaw Variant complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant community is Yellow Pine Forest. Elevation is 4,790 to 6,400 feet. The average annual precipitation is about 35 to 43 inches.

This unit is 60 percent Woolstalf gravelly fine sandy loam and 20 percent Hotaw Variant loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Woolstalf

Hotaw variant

Depth
Available Water Capacity
Total
Upper 20"

40 to 60 in
Moderate to low
5 to 6 in
2 in

20 to 30 in
Low
3 to 5 in
3 in

Permeability

Moderately rapid

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.24

0.37

Unified Soil Class

SM/GM

ML/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3Ep

3E

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and e, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of shallow soils, Rock outcrop, and Brownlee family soils. Included areas make up about 20 percent of the total acreage.

The Woolstalf soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 75 percent gravel and cobbles. Typically, the surface layer is dark brown and brown, gravelly and very gravelly fine sandy loam about 37 inches thick. The subsoil is yellowish brown extremely gravelly fine sandy loam about 22 inches thick over weathered metasedimentary rock.

The Hotaw Variant soil is moderately deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is dark brown gravelly loam and gravelly clay loam about 23 inches thick over fractured metasedimentary rock.

This unit is used for timber production and as limited rangeland in summer.

680 Woolstalf-Hotaw Variant-Rock outcrop complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,000 to 7,550 feet. The average annual precipitation is about 35 to 43 inches.

This unit is 40 percent Woolstalf gravelly fine sandy loam, 30 percent Hotaw Variant loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Woolstalf

Hotaw variant

Rock outcrop

Depth

40 to 60 in

20 to 30 in

Available Water Capacity

Moderate to low

Low

Total

5 to 6 in

3 to 5 in

Upper 20"

2 in

3 in

Permeability

Moderately rapid

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.24

0.37

Unified Soil Class

SM/GM

ML/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3E

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and e, very steep slopes, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, very steep slopes

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of shallow soils, Toem soils, Cagwin soils, and Brownlee family soils. Included areas make up about 10 percent of the total acreage.

The Woolstalf soil is deep and formed in residuum derived from metasedimentary rock. This soil is 35 to 75 percent gravel and cobbles. Typically, the surface layer is dark brown and brown, gravelly and very gravelly fine sandy loam about 37 inches thick. The subsoil is yellowish brown extremely gravelly fine sandy loam about 22 inches thick over weathered metasedimentary rock.

The Hotaw Variant soil is moderately deep and formed in residuum derived from metamorphic and metasedimentary rock. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is dark brown gravelly loam and gravelly clay loam about 23 inches thick over fractured metasedimentary rock.

Rock outcrop occurs as isolated outcroppings and massive exposures of metamorphic and metasedimentary rock.

This unit is used for timber production and as limited rangeland in summer.

681 Boomer-Crozier-Rock outcrop complex, 5 to 40 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. The native plant communities are White Fir Forest, Yellow Pine Forest, and Mixed Conifer Forest. Elevation is 4,790 to 6,560 feet. The average annual precipitation is about 20 to 39 inches.

This unit is 50 percent Boomer gravelly loam, 25 percent Crozier cobbly loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Boomer

Crozier

Rock outcrop

Depth

40 to 60+ in

20 to 40 in

Available Water Capacity

Moderate

Low

Total

6 to 8 in

4 to 5 in

Upper 20"

3 in

3 in

Permeability

Moderately slow

Moderate

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.32

0.28

Unified Soil Class

ML/CL

ML/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2e

3eX

Timber Production

CMAI (cu ft/acre)

85 to 119

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of shallow soils. Included areas make up about 10 percent of the total acreage.

The Boomer soil is deep and formed in residuum derived from basalt. Typically, the surface layer is reddish brown gravelly loam and sandy loam about 13 inches thick. The subsoil is light reddish brown sandy clay loam and clay loam about 38 inches thick over weathered basalt.

The Crozier soil is moderately deep and formed in residuum derived from basalt. Typically, the surface layer is brown and dark brown cobbly loam and loam about 8 inches thick. The subsoil is brown cobbly loam and cobbly clay loam about 24 inches thick over weathered basalt.

This unit is used mainly for timber production. It is also used as rangeland in summer.

685 Holland-Shaver association, 20 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on mountainsides and ridges. Slope is 20 to 50 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 4,590 to 5,570 feet. The average annual precipitation is about 30 to 39 inches.

This unit is 55 percent Holland sandy loam and 20 percent Shaver fine sandy loam.

Soil Map Unit
Components

Holland

Shaver

Depth

60+ in

40 to 60 in

Available Water Capacity

Moderate to high

Moderate

Total

7 to 10 in

6 to 9 in

Upper 20"

3 in

3 in

Permeability

Moderately slow

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.32

0.24

Unified Soil Class

ML/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3E

3E

Timber Production

CMAI (cu ft/acre)

120 to 164

85 to 119

Suitability

Suitable

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of Chaix soils, Chawanakee soils, Auberry soils, Rock outcrop, and Monache Variant soils, drained, warm. Included areas make up about 25 percent of the total acreage.

The Shaver soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown fine sandy loam about 43 inches thick. The substratum is yellowish brown gravelly fine sandy loam about 10 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam, coarse sandy loam, or loam.

This unit is used mainly for timber production. It is also used as limited rangeland in summer.

687 Wind River family-Dome-Rock outcrop association, 5 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountainsides. Slope is 5 to 30 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 6,000 to 7,400 feet. The average annual precipitation is about 20 to 24 inches.

This unit is 40 percent Wind River family loam, 30 percent Dome sandy loam, and 15 percent Rock outcrop.

Soil Map Unit Components

Wind River family

Dome

Rock outcrop

Depth

40 to 60+ in

40 to 60 in

Available Water Capacity Total Upper 20"

Moderate to low
4 to 6 in
3 in

Moderate to low
5 to 6 in
2 in

Permeability

Moderate

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or moderately well
drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.20

Unified Soil Class

ML/SC

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2e

2ep

Timber Production

CMAI (cu ft/acre)

85 to 119

85 to 164

Suitability

Suitable

Suitable

Limiting Factors

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Chaix soils, Chawanakee soils, and Monache Variant soils, drained, warm. Included areas make up about 15 percent of the total acreage.

The Wind River family soil is deep and formed in residuum derived from metamorphic, metasedimentary, and granitic rock. Typically, the surface layer is brown loam about 12 inches thick. The subsoil is brown and strong brown loam and gravelly loam about 20 inches thick. The substratum is pinkish gray very gravelly sandy loam about 10 inches thick over fractured metasedimentary rock.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

690 Holland-Dome-Chaix association, 5 to 40 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountainsides, and ridges. Slope is 5 to 40 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 5,000 to 6,790 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 30 percent Holland sandy loam, 30 percent Dome sandy loam, and 25 percent Chaix sandy loam.

Soil Map Unit Components

| | Holland | Dome | Chaix |
|--------------------------|-------------------|------------------|------------------|
| Depth | 60+ in | 40 to 60 in | 20 to 40 in |
| Available Water Capacity | Moderate to high | Moderate to low | Low |
| Total | 7 to 10 in | 5 to 6 in | 3 to 4 in |
| Upper 20" | 3 in | 2 in | 2 in |
| Permeability | Moderately slow | Moderately rapid | Moderately rapid |
| Hydrologic Soil Group | B | B | B |
| Drainage Class | Well drained | Well drained | Well drained |
| Runoff | Medium to rapid | Medium to rapid | Medium to rapid |
| Max Erosion Hazard | Moderate | Moderate | Moderate |
| Erosion Factor (K) | 0.32 | 0.20 | 0.20 |
| Unified Soil Class | SM/SC | SM | SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 2e | 2ep | 2ep |
| Timber Production | | | |
| CMAI (cu ft/acre) | 120 to 164 | 85 to 164 | 50 to 84 |
| Suitability | Suitable | Suitable | Suitable |
| Limiting Factors | | | |
| Range Production | | | |
| Seasons of Use | Summer | Summer | Summer |
| Limiting Factors | Plant competition | | |
| Soil Manageability Group | II | II | II |

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop, Chawanakee soils, and Monache Variant soils, drained, warm. Included areas make up about 15 percent of the total acreage.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as rangeland in summer.

693 Holland-Hotaw association, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountain sides, and ridges. Slope is 10 to 30 percent. The native plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. Elevation is 3,610 to 9,510 feet. The average annual precipitation is about 24 to 35 inches.

This unit is 55 percent Holland sandy loam and 30 percent Hotaw sandy loam soils.

Soil Map Unit Components

Holland

Hotaw

Depth

60+ in

20 to 40 in

Available Water Capacity

Moderate to high

Moderate to low

Total

7 to 10 in

4 to 6 in

Upper 20"

3 in

3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Medium or rapid

Medium or rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.32

0.37

Unified Soil Class

SM/SC

SC/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2e

2e

Timber Production

CMAI (cu ft/acre)

120 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

No prominent limitations

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this unit are small areas of Rock outcrop, Shaver, Chaix, and Chawanakee soils. Included areas make up about 15 percent of the total areas.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Hotaw soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 6 inches thick. The subsoil is light yellowish brown and strong brown sandy clay loam and clay loam about 26 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used for summer range.

694 Holland-Hotaw association, 30 to 50 percent slopes.

Physiographic
Location,
Elevation, and
Precipitation

This map unit is on foothills, mountain sides, and ridges. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest and White Fir Forest. Elevation is 3,200 to 6,000 feet. The average annual precipitation is about 24 to 39 inches.

This unit is 55 percent Holland sandy loam and 30 percent Hotaw sandy loam soils.

Soil Map Unit
Components

Holland

Hotaw

Depth

60+ in

20 to 40 in

Available Water Capacity

Moderate to high

Moderate to low

Total

7 to 10 in

4 to 6 in

Upper 20"

3 in

3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

Moderate

High

Erosion Factor (K)

0.32

0.37

Unified Soil Class

SM/SC

SC/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

2e

2E

Timber Production

CMAI (cu ft/acre)

120 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

No prominent limitations

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability
Group

II

II

Included Areas &
Remarks

Included in this unit are small areas of Rock outcrop, Shaver, Chaix, and Chawanakee soils. Included areas make up about 15 percent of the total areas.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam.

The Hotaw soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 6 inches thick. The subsoil is light yellowish brown and strong brown sandy clay loam and clay loam about 26 inches thick over highly weathered granitic rock.

This unit is used mainly for timber production. It is also used as limited summer range.

696 Chaix-Rock Outcrop-Dome complex, 10 to 30 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountain sides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Mixed Conifer Forest. Elevation is 5,410 to 7,710 feet. The average annual precipitation is about 35 to 51 inches.

This unit is 40 percent Chaix sandy loam soils, 20 percent Rock Outcrop, and 20 percent Dome sandy loam soils. The components of this are so intricately intermingled that it was not practice to map at the scale used.

Soil Map Unit Components

Chaix

Rock outcrop

Dome

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Low

Moderate to low

Total

3 to 4 in

5 to 6 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Runoff

Medium to rapid

Medium to rapid

Max Erosion Hazard

Moderate

Moderate

Erosion Factor (K)

0.20

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

2ep

2ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition

Soil Manageability Group

II

II

Included Areas & Remarks

Included in this are small areas of Chawanakee and Holland soils. Included areas make up about 20 percent of the total area.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as summer range.

697 Chaix-Rock Outcrop-Dome complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountain sides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. Elevation is 4,760 to 8,370 feet. The annual precipitation is about 30 to 46 inches.

This unit is 40 percent Chaix sandy loam soils, 30 percent Rock Outcrop and 15 percent Dome sandy loam soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix

Rock outcrop

Dome

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Low

Moderate to low

Total

3 to 4 in

5 to 6 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

3Ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

Suitability

Poorly suited

Suitable

Limiting Factors

Regeneration difficulty—d and f, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, steep slopes, plant competition

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Chawanakee and Holland soils. Included areas make up about 15 percent of the total area.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Dome soil is deep and formed residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used mainly for timber production. It is also used as limited summer range.

698 Chaix-Rock Outcrop-Dome complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountain and ridges. The native plant communities are Yellow Pine Forest, and Mixed Conifer Forest. Elevation is 4,430 to 8,370 feet. The average annual precipitation is about 30 to 45 inches.

This unit is 35 percent Chaix sandy loam soils, 35 percent Rock outcrop, and 15 percent Dome sandy loam soils. The components of this are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Chaix

Rock outcrop

Dome

Depth

20 to 40 in

40 to 60 in

Available Water Capacity

Low

Moderate to low

Total

3 to 4 in

5 to 6 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained or somewhat
excessively drained

Well drained

Runoff

Very rapid

Very rapid

Max Erosion Hazard

Very high

Very high

Erosion Factor (K)

0.20

0.20

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

4Ep

4Ep

Timber Production

CMAI (cu ft/acre)

50 to 84

85 to 164

Suitability

Poorly suited

Suitable

Limiting Factors

Regeneration difficulty—d and f, very steep slopes, very high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Rock outcrop, very steep slopes, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Chawanakee and Holland soils. Included areas make up about 15 percent of the total area.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of granitic rock.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale brown sandy loam about 22 inches thick over highly weathered granitic rock. In areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production. It is also used as limited summer range.

700 Holland-Bohna association, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills and mountain sides. It is in a transitional from cool to warm soil temperatures. Slope is 30 to 50 percent. The native plant communities are Yellow Pine Forest, Montane Chaparral, Foothill Woodland, and Mixed Chaparral. Elevation is 3,610 to 5,810 feet. The average annual precipitation is about 45 to 90 centimeters.

This unit is 40 percent Holland sandy loam and 40 percent Bohna sandy loam soils.

Soil Map Unit Components

Holland*

Bohna

Depth
Available Water Capacity
Total
Upper 20"

60+ in
Moderate to high
7 to 10 in
3 in

40 to 60 in
Moderate to high
7 to 10 in
3 in

Permeability

Moderately slow

Moderately slow

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.32

0.28

Unified Soil Class

SM/SC

ML-CL/CL

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability
Class

3E

3E

Timber Production

CMAI (cu ft/acre)

50 to 84*

—

Suitability

Poorly suited

Incapable

Limiting Factors

Regeneration difficulty—c

Range Production

Seasons of Use

Spring and summer

Spring and summer

Limiting Factors

Soil Manageability
Group

III

III

Included Areas &
Remarks

Included in this unit are small areas of Rock outcrop and Cieneba soils. Included areas make up about 20 percent of the total area.

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam

The Bohna soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loam about 19 inches thick. The subsoil is brown sandy clay loam about 24 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used mainly as spring-summer range. It is also used for timber production.

* Footnote: Timber production value lower than typical for the Holland series in Sequoia National forest.

701 Holland-Bohna-Cieneba association, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on foothills, mountain sides, and ridges. It is in a transitional areas from cool to warm soil temperatures. Slope is 50 to 75 percent. The native plant communities are Yellow Pine Forest, Montane Chaparral, Foothill Woodland, and Mixed Chaparral. Elevation is 3,940 to 6,200 feet. The average annual precipitation is about 24 to 39 inches.

This unit is 40 percent Holland, 30 percent Bohna, and 15 percent Cieneba soils.

Soil Map Unit Components

| | Holland* | Bohna | Cieneba |
|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|
| Depth | 60+ in | 40 to 60 in | 4 to 20 in |
| Available Water Capacity | Moderate to high | Moderate to high | Very low |
| Total | 7 to 10 in | 7 to 10 in | 1 to 2 in |
| Upper 20" | 3 in | 3 in | 1 in |
| Permeability | Moderately slow | Moderately slow | Moderately rapid |
| Hydrologic Soil Group | B | B | C |
| Drainage Class | Well drained | Well drained | Somewhat excessively drained |
| Runoff | Very rapid | Very rapid | Very rapid |
| Max Erosion Hazard | High | High | Very high |
| Erosion Factor (K) | 0.32 | 0.28 | 0.32 |
| Unified Soil Class | SM/SC | ML-CL/CL | SM |
| Soil & Rock Color | Intermediate | Intermediate | Intermediate |
| Soil Manageability Class | 4E | 4E | 4EPd |
| Timber Production | | | |
| CMAI (cu ft/acre) | 50 to 84* | — | — |
| Suitability | Poorly suited | Incapable | Incapable |
| Limiting Factors | Regeneration difficulty—a, c and d, steep slopes, very high erosion hazard | | |
| Range Production | | | |
| Seasons of Use | Spring and summer | Spring and summer | Spring and summer |
| Limiting Factors | Rock outcrop, shallow soils, very steep slopes | | |
| Soil Manageability Group | IV | IV | IV |
| Included Areas & Remarks | Included in this unit are small areas of Rock outcrop. Included areas make up about 15 percent of the total areas. | | |

The Holland soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is pale brown and light yellowish brown sandy clay loam about 55 inches thick over highly weathered granitic rock. In some areas the surface layer is loam

The Bohna soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is brown loam about 19 inches thick. The subsoil is brown sandy clay loam about 24 inches thick over highly weathered granitic rock. In some areas the surface layer is sandy loam.

The Cieneba soil is shallow and formed in residuum derived from granitic rock. The Cieneba soil is pale brown coarse sandy loam about 12 inches deep over highly weathered granitic rock. In some areas the surface layer is sandy loam.

This unit is used mainly as spring-summer range. It is also used for timber production.

* Footnote: Timber production value lower than typical for the Holland series in Sequoia National forest.

713 Jumpe-Chumstick families- Rock outcrop complex, 30 to 60 percent slopes.

Physiographic Location, Elevation, and Precipitation

The map unit is on mountain sides and ridges. The native plant communities are Red Fir Forest, Lodgepole Pine Forest, and White Fir Forest. Elevation is 7,990 to 8,790 feet. The average annual precipitation is about 35 to 39 inches.

This unit is 60 percent Jumpe family soils, 15 percent Chumstick family soils, and 10 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map than separately at the scale used.

Soil Map Unit Components

Jumpe family Chumstick family Rock outcrop

Depth

40 to 60 in

6 to 20 in

Available Water Capacity

Low

Very low

Total

3 to 5 in

1 to 2 in

Upper 20"

2 in

2 in

Permeability

Moderately rapid

Moderate

Hydrologic Soil Group

B

D

Drainage Class

Well drained

Well drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.17

0.32

Unified Soil Class

SM/GM

SM/GC

Soil & Rock Color

Low

Low

Soil Manageability Class

3Ep

3Epd

Timber Production

CMAI (cu ft/acre)

50 to 84

20 to 49

Suitability

Poorly suited

Poorly suited

Limiting Factors

Regeneration difficulty—a, and d, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, steep slopes

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Baldmountain soils. Included areas make up about 15 percent of the total area.

The Jumpe family soil is deep and formed in residuum derived from metasedimentary rock. This soil 35 to 90 percent gravel and cobbles. Typically, the surface layer is brown sandy loam about 8 inches thick. The subsoil brown fine sandy loam about 16 inches thick. The substatum is reddish yellow very loam and extremely gravelly and cobbly fine sandy loam about 28 inches thick over fractured metasedimentary rock.

The Chumstick family soil is shallow and formed in residuum derived from metamorphic rock. This soil is 35 to 65 percent gravel and cobbles. Typically, the surface layer is brown gravelly loam about 6 inches thick. The subsoil is brown gravelly and very gravelly loam about 11 inches thick over weathered, hard metamorphic rock. In some areas surface layer is clay loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of metamorphic rock.

This unit is used for timber production and as limited summer range.

725 Dome-Rock outcrop-Chaix complex, 30 to 50 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountain sides and ridges. The native plant communities are Yellow Pine Forest, and Montane Chaparral. Elevation is 5,910 to 7,220 feet. The average annual precipitation is about 30 to 45 inches.

This unit is 40 percent Dome soils, 30 percent Rock outcrop, and 20 percent Chaix soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Dome

Rock outcrop

Chaix

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate to low

Low

Total

5 to 6 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained to somewhat
excessively drained

Runoff

Rapid

Rapid

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

4EP

Timber Production

CMAI (cu ft/acre)

85 to 164

50 to 84

Suitability

Suitable

Suitable

Limiting Factors

Regeneration difficulty—d and f, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Plant competition, rock outcrop, steep slopes

Soil Manageability Group

III

III

Included Areas & Remarks

Included in this unit are small areas of Holland soils. Included areas make up about 10 percent of the total area.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale sandy loam about 22 inches thick over highly weathered granitic rock. In areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of metamorphic rock.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface is brown sandy loam about 7 inches thick. The subsoil is brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production and as limited summer range.

726 Dome-Rock outcrop-Chaix complex, 50 to 75 percent slopes.

Physiographic Location, Elevation, and Precipitation

This map unit is on mountain sides and ridges. The native plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. Elevation is 4,760 to 7,220 feet. The average annual precipitation is about 24 to 39 inches.

This unit is 40 percent Dome soils, 30 percent Rock outcrop, and 25 percent Chaix soils. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Soil Map Unit Components

Dome

Rock outcrop

Chaix

Depth

40 to 60 in

20 to 40 in

Available Water Capacity

Moderate

Low

Total

5 to 6 in

1 to 3 in

Upper 20"

2 in

1 in

Permeability

Moderately rapid

Moderately rapid

Hydrologic Soil Group

B

B

Drainage Class

Well drained

Well drained to somewhat
excessively drained

Runoff

Slow

Slow

Max Erosion Hazard

High

High

Erosion Factor (K)

0.20

0.24

Unified Soil Class

SM

SM

Soil & Rock Color

Intermediate

Intermediate

Soil Manageability Class

3Ep

4EP

Timber Production

CMAI (cu ft/acre)

85 to 164

50 to 84

Suitability

Suitable

Poorly suited

Limiting Factors

Regeneration difficulty—d and f, very steep slopes, high erosion hazard

Range Production

Seasons of Use

Summer

Summer

Limiting Factors

Very steep slopes, rock outcrop, plant competition

Soil Manageability Group

IV

IV

Included Areas & Remarks

Included in this unit are small areas of Holland soils. Included areas make up about 5 percent of the total area.

The Dome soil is deep and formed in residuum derived from granitic rock. Typically, the surface layer is grayish brown sandy loam about 7 inches thick. The subsoil is pale brown sandy loam about 21 inches thick. The substratum is very pale sandy loam about 22 inches thick over highly weathered granitic rock. In areas the surface layer is coarse sandy loam.

Rock outcrop occurs as isolated outcroppings and massive exposures of metamorphic rock.

The Chaix soil is moderately deep and formed in residuum derived from granitic rock. Typically, the surface is brown sandy loam about 7 inches thick. The subsoil is brown sandy loam about 19 inches thick over highly weathered granitic rock. In some areas the surface layer is coarse sandy loam.

This unit is used mainly for timber production and as limited summer range.

Notice

The soil map unit descriptions in this reprint have been updated and printed in a more compact form. Most map units took two pages in the previous version of this document, now each map unit takes only one page. The map unit descriptions in this reprint end on page 140, instead of page 241 as they did in the previous version.

The rest of this document has been reprinted without change (including the page numbers), creating a gap in the *numbering* of the pages only. This is the reason page numbers 141 through 240 are omitted in this reprint.

| Map symbol | Map unit name | Acres | Percent |
|---------------|-------------------------------------------------------------------------------|--------|---------|
| 303 | Monache Variant, drained-Monache association, gently sloping | 12,560 | 0.9 |
| 306 | Monache Variant, drained, warm-Junipero family association, gently sloping | 3,205 | 0.2 |
| 309 | Monache-Tyoic Haloxerolls-Cagwin Vaiant association, sloping | 4,949 | 0.4 |
| 310 | Cagwin Variant loamy coarse sand, 5 to 15 percent slopes | 3,366 | 0.2 |
| 311 | Cannell-Nanny family-Monache Variant association moderately steep | 3,571 | 0.3 |
| 400 | Rock outcrop | 90,456 | 6.7 |
| 404 | Rock outcrop-Xerorthents association, steep | 2,881 | 0.2 |
| 409 | Rock outcrop-Toem-Sirretta complex, 10 to 30 percent slopes | 13,586 | 1.0 |
| 410 | Rock outcrop-Toem complex, 30 to 50 percent slopes, | 28,566 | 2.1 |
| 411 | Rock outcrop-Toem complex, 50 to 75 percent slopes, | 11,994 | 0.9 |
| 414 | Rock outcrop-Chualar family complex, 50 to 75 percent slopes | 3,699 | 0.3 |
| 419 | Rock outcrop-Cieneba complex, 30 to 50 percent slopes | 3,326 | 0.2 |
| 420 | Rock outcrop-Cieneba complex, 50 to 75 percent slopes | 40,295 | 3.0 |
| 421 | Rock outcrop-Tollhouse complex, 15 to 30 percent slopes | 19,946 | 1.5 |
| 422 | Rock outcrop-Tollhouse complex, 30 to 50 percent slopes | 19,331 | 1.4 |
| 423 | Rock outcrop-Tollhouse complex, 50 to 75 percent slopes | 15,721 | 1.2 |
| 429 | Rock outcrop-Cieneba-Chawanakee complex, 30 to 75 percent slopes | 9,948 | 0.7 |
| 430 | Rock outcrop-Chawanakee-Chaix complex, 15 to 30 percent slopes | 11,354 | 0.8 |
| 431 | Rock outcrop-Chawanakee-Chaix complex, 30 to 50 percent slopes | 2,399 | 0.2 |
| 432 | Rock outcrop-Chawanakee-Chaix complex, 50 to 75 percent slopes | 12,763 | 0.9 |
| 434 | Rock outcrop-Baldmountain complex, 30 to 50 percent slopes | 2,224 | 0.2 |
| 435 | Rock outcrop-Baldmountain complex, 50 to 75 percent slopes | 11,391 | 0.8 |
| 443 | Rubble land-Xerorthents complex, 5 to 30 percent slopes | 2,790 | 0.2 |
| 444 | Rock outcrop-Brader-Siskiyou families complex, 20 to 60 percent slopes | 7,114 | 0.6 |
| 445 | Rock outcrop-Cieneba-Brader family complex, 50 to 75 percent slopes | 51,459 | 3.9 |

| Map symbol | Map unit name | Acres | Percent |
|---------------|----------------------------------------------------------------------------------|--------|---------|
| 446 | Siskiyou-Brader families-Rock outcrop complex, 5 to 30 percent slopes | 14,164 | 1.2 |
| 447 | Siskiyou family-Rock outcrop-Brader family complex, 30 to 75 percent slopes | 29,696 | 2.3 |
| 500 | Tollhouse-Rock outcrop complex, 10 to 30 percent slopes | 18,594 | 1.4 |
| 501 | Tollhouse-Rock outcrop complex, 30 to 50 percent slopes | 8,794 | 0.6 |
| 502 | Tollhouse-Rock outcrop complex, 50 to 75 percent slopes | 15,676 | 1.2 |
| 503 | Tollhouse-Chaix association, moderately steep | 8,139 | 0.6 |
| 509 | Chaix-Wind River family-Tollhouse association, sloping | 73,042 | 0.5 |
| 601 | Brownlee family-Hotaw Variant complex, 30 to 50 percent slopes | 7,514 | 0.6 |
| 603 | Cannell-Sirretta-Nanny family complex, 5 to 30 percent slopes | 32,491 | 2.4 |
| 604 | Cannell-Sirretta-Nanny family complex, 30 to 50 percent slopes | 15,931 | 1.2 |
| 606 | Toem-Rock outcrop-Cagwin complex, 5 to 30 percent slopes | 23,596 | 1.7 |
| 607 | Toem-Rock outcrop-Cagwin complex, 30 to 75 percent slopes | 50,774 | 3.8 |
| 609 | Cagwin-Toem-Rock outcrop complex, 5 to 30 percent slopes | 43,747 | 3.3 |
| 610 | Cagwin-Toem-Rock outcrop complex, 30 to 50 percent slopes | 24,510 | 1.8 |
| 611 | Cagwin-Toem-Rock outcrop complex, 50 to 75 percent slopes | 18,241 | 1.3 |
| 612 | Baldmountain-Rock outcrop-Jumpe family complex, 5 to 30 percent slopes | 6,370 | 0.5 |
| 613 | Baldmountain-Rock outcrop-Jumpe family complex, 30 to 50 percent slopes | 7,964 | 0.6 |
| 618 | Chaix-Chawanakee-Rock outcrop complex, 5 to 30 percent slopes | 17,826 | 1.3 |
| 619 | Chaix-Rock outcrop-Chawanakee complex, 30 to 50 percent slopes | 27,967 | 2.0 |
| 620 | Chaix-Rock outcrop-Chawanakee complex, 50 to 75 percent slopes | 12,918 | 0.9 |
| 621 | Dome-Chaix-Rock outcrop association, moderately steep | 27,690 | 2.0 |
| 622 | Dome-Chaix-Rock outcrop association, steep | 13,919 | 1.0 |
| 624 | Sirretta-Rock outcrop-Cannell complex, 5 to 30 percent slopes | 1,885 | 0.1 |
| 625 | Sirretta-Rock outcrop-Nanny family complex, 30 to 50 percent slopes | 7,561 | 0.5 |
| 628 | Nanny family-Toem complex, 30 to 50 percent slopes | 2,535 | 0.1 |

| Map symbol | Map unit name | Acres | Percent |
|---------------|--------------------------------------------------------------------------------|--------|---------|
| 631 | Chesaw family-Toem-Rock outcrop complex, 30 to 50 percent slopes | 2,501 | 0.2 |
| 635 | Hotaw Variant-Brownlee family-Rock outcrop complex, 40 to 75 percent slopes | 2,629 | 0.2 |
| 638 | Sirretta-Rock outcrop complex, 50 to 75 percent slopes | 62,313 | 4.6 |
| 639 | Cagwin-Toem-Monache association, moderately steep | 7,682 | 0.6 |
| 640 | Cagwin-Toem-Monache association, steep | 3,840 | 0.3 |
| 643 | Glean Variant extremely gravelly fine sandy loam, 20 to 60 percent slopes | 4,401 | 0.3 |
| 645 | Cannell-Kriest family-Rock outcrop complex, 5 to 30 percent slopes | 10,410 | 1.8 |
| 646 | Cannell-Kriest family-Rock outcrop complex, 30 to 50 percent slopes | 11,391 | 0.8 |
| 647 | Cannell-Kriest family-Rock outcrop complex, 50 to 75 percent slopes | 2,864 | 0.2 |
| 648 | Kriest family-Cannell-Rock outcrop complex, 5 to 30 percent slopes | 4,171 | 0.3 |
| 651 | Shaver-Holland association, moderately steep | 2,691 | 0.2 |
| 655 | Wind River family-Shaver association, steep | 1,915 | 0.1 |
| 657 | Chaix-Dome-Holland association, moderately steep | 2,520 | 0.2 |
| 658 | Chaix-Dome-Holland association, steep | 4,759 | 0.3 |
| 660 | Shaver-Chaix association, moderately steep | 6,071 | 0.4 |
| 661 | Shaver-Chaix association, steep | 3,279 | 0.2 |
| 662 | Shaver-Chaix association, very steep | 1,910 | 0.1 |
| 663 | Chawanakee-Rock outcrop-Chaix complex, 5 to 30 percent slopes | 4,650 | 0.3 |
| 664 | Chawanakee-Rock outcrop-Chaix complex, 30 to 50 percent slopes | 27,139 | 2.0 |
| 665 | Chawanakee-Rock outcrop-Chaix complex, 50 to 75 percent slopes | 9,664 | 0.7 |
| 666 | Wind River family-Rock outcrop association, moderately steep | 3,820 | 0.3 |
| 667 | Wind River family-Rock outcrop association, steep | 1,320 | 0.1 |
| 670 | Chaix-Dome-Rock outcrop complex, 30 to 50 percent slopes | 22,036 | 1.6 |
| 671 | Chaix-Dome-Rock outcrop complex, 50 to 75 percent slopes | 4,465 | 0.3 |
| 672 | Dome-Chaix association, moderately steep | 7,371 | 0.5 |
| 673 | Dome-Chaix association, steep | 2,261 | 0.2 |
| 674 | Dome-Chaix association, very steep | 1,740 | 0.1 |
| 675 | Woolstalf-Rock outcrop complex, 10 to 30 percent slopes | 1,720 | 0.1 |
| 676 | Woolstalf-Rock outcrop complex, 30 to 50 percent slopes | 14,080 | 1.0 |
| 677 | Woolstalf-Rock outcrop complex, 50 to 75 percent slopes | 1,930 | 0.1 |

| Map symbol | Map unit name | Acres | Percent |
|---------------|---------------------------------------------------------------------------|-----------|---------|
| 679 | Woolstalf-Hotaw Variant complex, 30 to 50 percent slopes | 1,124 | 0.1 |
| 680 | Woolstalf-Hotaw Variant-Rock outcrop complex, 50 to 75 percent slopes | 7,840 | 0.6 |
| 681 | Boomer-Crozier-Rock outcrop complex, 5 to 40 percent slopes | 7,220 | 0.5 |
| 685 | Holland-Shaver association, steep | 3,220 | 0.2 |
| 687 | Wind River family-Dome-Rock outcrop association, moderately steep | 1,779 | 0.1 |
| 690 | Holland-Dome-Chaix association, moderately steep | 4,201 | 0.3 |
| 693 | Holland-Hotaw association, moderately steep | 12,595 | 0.9 |
| 694 | Holland-Hotaw association, steep | 7,734 | 0.6 |
| 696 | Chaix-Rock outcrop-Dome complex, 10 to 30 percent slopes | 2,511 | 0.2 |
| 697 | Chaix-Rock outcrop-Dome complex, 30 to 50 percent slopes | 10,586 | 0.8 |
| 698 | Chaix-Rock outcrop-Dome complex, 50 to 75 percent slopes | 5,886 | 0.4 |
| 700 | Holland-Bohna association, steep | 4,749 | 0.3 |
| 701 | Holland-Bohna-Cieneba association, very steep | 2,251 | 0.2 |
| 713 | Jumpe-Chumstick families-Rock outcrop complex, 30 to 60 percent slopes | 3,010 | 0.2 |
| 725 | Dome-Rock outcrop-Chaix complex, 20 to 50 percent slopes | 4,220 | 0.3 |
| 726 | Dome-Rock outcrop-Chaix complex, 50 to 75 percent slopes | 4,129 | 0.3 |
| TOTAL | | 1,360,577 | |

Table 3. - Soil Components in Map Units

| Component name | Named Primary Component | Named Inclusion |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Auberry | 105,112,114,119,120, 212,213,224,225 | 125,685 |
| Baldmountain | 434,435,612,613 | 666,667,675,676, 677,713 |
| Bohna | 106,107,700,701 | |
| Boomer | 681 | |
| Brader family | 444,445,446,447 | |
| Brownlee family | 601,635 | 679,680 |
| Cagwin | 606,607,609,610,611 639,640 | 303,409,410,411,430, 431,432,434,435,603, 604,612,613,631,638, 666,667,680 |
| Cagwin Variant | 309,310 | 303 |
| Cannell | 311,603,604,624,645, 646,647,648 | 303,409,435,606,607, 609,610,611,612,613, 625,639,640 |
| Chaix | 430,431,432,503,509, 618,619,620,621,622, 657,658,660,661,662, 663,664,665,670,671 672,673,674,690,696, 697,698,726 | 212,213,306,421,422, 429,444,446,447,500, 624,625,651,675,676, 677,685,687,693,694 |
| Chawanakee | 429,430,431,432,618, 619,620,663,664,665 | 212,213,444,445,446, 447,621,622,657,660, 661,662,670,671,672, 673,674,684,685,687, 690,693,694,694,697, 698 |
| Chawanakee Variant | 122,123 | |
| Chesaw family | 219,221,631 | 309,310 |
| Chualar family | 203,205,414 | 201,202,236,238,419, 420,635 |

| Component name | Named Primary Component | Named Inclusion |
|-----------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Chumstick family | 713 | |
| Cieneba | 201,202,212,213, 419,420,429,445, | 105,106,107,112,114, 125,203,205,224,225, 414,421,422,423,501, 502,700 |
| Crozier | 681 | |
| Dome | 621,622,657,658,670, 671,672,673,674,687, 690,696,697,698,725 726 | 302,306,430,431,432, 444,446,447,618,619, 620,624,625,663,664 665,675,676,677 |
| Glean Variant | 643 | |
| Gullied lands | | 125 |
| Holland | 112,114,651,657,658, 685,690,693,694,700, | 302,618,619,620,621, 635,655,660,661,662, 670,671,696,697,698, 725,726 |
| Hotaw | 693,694 | 651,690 |
| Hotaw Variant | 601,635,679,680 | |
| Jumpe family | 612,613,713 | |
| Junipero family | 306 | 621,622 |
| Kanaka family | 116,119,120,122, 123 | |
| Kriest family | 645,646,647,648 | |
| Livermore family | 236,238 | |
| Millerton family | 116 | |
| Monache | 221,303,309,639,640 610 | 603,604,606,607,609, |
| Monache Variant | 311 | |
| Monache Variant, drained | 303 | 310,603,604,606,607, 609,610,639,640, |

| Component name | Named Primary Component | Named Inclusion |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monache Variant, drained, warm | 302,306 | 660,661,662,685,687, 690 |
| Nanny family | 219,221,311,603, 604,625,628 | 309,310,409,606,607, 609,610,611,612,613, 624,631 |
| Riverwash | 300 | |
| Rock outcrop | 116,119,120,122,123, 125,200,201,202,203, 205,212,213,219,236, 238,400,401,402,404, 409,410,411,414,419, 420,421,422,428,429, 430,431,432,434,435, 500,501,502,606,607, 609,610,611,612,613, 619,620,621,622,624, 625,628,631,635,638, 645,646,647,648,663, 664,665,666,667,670, 671,677,680,687,696, 697,698,713,714,724, 725 | 105,106,107,112,114, 221,224,225,302,311, 443,503,509,601,603, 604,643,651,657,658, 660,661,662,672,673, 674,684,685,690,693, 694,701,702,703 |
| Rubble land | 443 | |
| Shallow Soils | | 116,125,679,680,681 |
| Shaver | 651,660,661,662,685 | 635,665,693,694 |
| Shaver Variant | 125 | |
| Sirretta | 409,603,604,624,625, 638 | 313,606,607,609,610, 611 |
| Siskuyou | | |
| Toem | 409,410,411,606,607, 609,610,611,628,631, 639,640 | 303,430,431,432,434, 435,603,604,612,613, 638,645,646,647,666, 667,680 |
| Tollhouse | 421,422,423,500,501, 502,503,509 | 125,200,201,202,419, 428,429,430,434, |
| Tollhouse Variant | 125 | |

| Component name | Named Primary Component | Named Inclusion |
|--------------------|-----------------------------|-------------------------------------|
| Typic Haploxerolls | 309 | |
| Wind River family | 302,509,655,666,667, 687 | 212,213,434 |
| Woolstalf | 675,676,677,679,680 | 663,664,665,666,667, 672,673,674 |
| Xerofluvent | 301,302 | 203,205 |
| Xerorthents | 300,301,404,443 | |

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 4, the soils of the survey area are listed alphabetically and are classified according to the system. In table 5, the soils are listed by the categories. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in "soil". An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeralf "Xer", meaning dry, plus "alf", from Alfisol.

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haploxeralf ("Hapl", meaning minimal horizonation, plus "xeralf", the suborder of the Alfisols that have a xeric moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are inter-grades or extragrades. The

typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective "Lithic" identifies the subgroup that has hard parent rock within 50 centimeters of the surface. An example is Lithic Haploxeralfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy, mixed, thermic Lithic Haploxeralfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer of the substratum can differ within a series.

Table 7 lists laboratory and field analysis for selected soils. The levels of base saturation and organic carbon are used to place the soils in the classification categories. After the analysis with field kits, duplicate samples of selected soils were sent to the National Soil Survey Laboratory for verification. All samples were from the typical pedon except for the Chaix and Cagwin series.

Table 4. - Classification by Soil Name

| Soil name | Family or higher taxonomic class |
|--------------------|-----------------------------------------------------------|
| Auberry* | Fine-loamy, mixed, thermic Ultic Haploxeralfs |
| Baldmountain | Coarse-loamy, mixed, frigid Ultic Haploxerolls |
| Bohna | Fine-loamy, mixed, thermic Typic Argixerolls |
| Boomer | Fine-loamy, mixed, mesic Ultic Haploxeralfs |
| Brader family | Loamy, mixed, mesic, shallow Typic Xerochrepts |
| Brownlee family | Fine-loamy, mixed, mesic Ultic Argixerolls |
| Cagwin | Mixed, frigid Dystric Xeropsamments |
| Cagwin Variant | Mixed, frigid Dystric Xeropsamments |
| Cannell | Coarse-loamy, mixed, frigid Dystric Xerochrepts |
| Chaix* | Coarse-loamy, mixed, mesic Dystric Xerochrepts |
| Chawanakee | Loamy, mixed, mesic, shallow Dystric Xerochrepts |
| Chawanakee Variant | Loamy, mixed, thermic, shallow Dystric Xerochrepts |
| Chesaw family | Sandy-skeletal, mixed, frigid Entic Haploxerolls |
| Chualar family | Fine-loamy, mixed, thermic Typic Argixerolls |
| Chumstick family | Loamy-skeletal, mixed, frigid Lithic Xerochrepts |
| Cieneba | Loamy, mixed, nonacid, thermic, shallow Typic Xerorthents |
| Crozier | Fine-loamy, mixed, mesic Ultic Haploxeralfs |
| Dome | Coarse-loamy, mixed, mesic Dystric Xerochrepts |
| Glean Variant | Loamy-skeletal, mixed, frigid Entic Ultic Haploxerolls |
| Holland* | Fine-loamy, mixed, mesic Ultic Haploxeralfs |
| Hotaw | Fine-loamy, mixed, mesic Ultic Haploxeralfs |
| Hotaw Variant | Fine-loamy, mixed, mesic Ultic Haploxeralfs |
| Jumpe family | Loamy-skeletal, mixed, frigid Dystric Xerochrepts |
| Junipero family | Coarse-loamy, mixed, mesic Pachic Ultic Haploxerolls |
| Kanaka family | Coarse-loamy, mixed, thermic Dystric Xerochrepts |
| Kriest family | Coarse-loamy, mixed, frigid Dystric Xerochrepts |
| Livermore family | Loamy-skeletal, mixed, thermic Typic Haploxerolls |
| Millerton family | Loamy, mixed, thermic Lithic Haploxeralfs |
| Monache | Coarse-loamy, mixed, frigid cumulic Ultic Haploxerolls |
| Monache Variant | Coarse-loamy, mixed, frigid Cumulic Haplaquolls |
| Nanny family | Loamy-skeletal, mixed, frigid Typic Xerumbrepts |
| Shaver | Coarse-loamy, mixed, mesic Pachic Xerumbrepts |
| Shaver Variant | Coarse-loamy, mixed, thermic Pachic Ultic Haploxerolls |
| Sirretta | Sandy-skeletal, mixed, frigid Dystric Xerorthents |
| Siskiyou family | Coarse-loamy, mixed, mesic Typic Xerochrepts |
| Toem | Mixed, frigid, shallow Dystric Xeropsamments |
| Tollhouse | Loamy, mixed, mesic, shallow Entic Haploxerolls |
| Tollhouse Variant | Loamy, mixed, thermic, shallow Entic Haploxerolls |
| Wind River family | Coarse-loamy, mixed, mesic Ultic Haploxerolls |
| Woolstalf | Loamy-skeletal, mixed, mesic Pachic Ultic Haploxerolls |

* Indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

Table 5. - Classification by Taxonomic Category

| Order | Suborder | Great Group | Subgroup | Family | Soil Name |
|-------------|----------------------|-----------------------------|----------------------|----------------------------------------|--------------------------------------------------------|
| ALFISOLS | Xeralfs | Haploxeralfs | Lithic Haploxeralfs | loamy, mixed, thermic | Millerton family |
| | | | Ultic Haploxeralfs | fine-loamy, mixed, mesic | Boomer Crozier Holland Hotaw Hotaw Variant |
| ENTISOLS | Fluvents Orthents | Xerofluvents Xerorthents | | fine-loamy, mixed, thermic | Auberry Xerofluvents Xerorthents |
| | | | Typic Xerorthents | loamy, mixed, nonacid, thermic shallow | Cienaba |
| | | | Dystic Xerorthents | sandy-skeletal, mixed, frigid | Sirretta |
| | Psamments | Xeropsamments | Dystic Xeropsamments | mixed, frigid | Cagwin Cagwin Variant |
| INCEPTISOLS | Ochrepts | Xerochrepts | Typic Xerochrepts | mixed, frigid, shallow | Toem |
| | | | | loamy, mixed, mesic, shallow | Brader family |
| | | | | coarse-loamy, mixed, mesic | Siskiyou family |
| | | | Dystic Xerochrepts | loamy-skeletal, mixed, frigid | Jumpe family |
| | | | | loamy, mixed, mesic, shallow | Chawanakee |
| | | | | loamy, mixed, thermic, shallow | Chawanakee Var. |
| | Umbrepts | Xerumbrepts | | coarse-loamy, mixed, frigid | Cannell Kriest family |
| | | | | coarse-loamy, mixed, mesic | Chaix Dome |
| | | | Lithic Xerochrepts | coarse-loamy, mixed thermic | Kanaka family |
| | | | Typic Xerumbrepts | loamy-skeletal, mixed, frigid | Chumstick family |
| | | | Pachic Xerumbrepts | loamy-skeletal, mixed, frigid | Nanny family |
| | | | | coarse-loamy, mixed, mesic | Shaver |

| Order | Suborder | Great Group | Subgroup | Family | Soil Name |
|-----------|----------|--------------|-------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------|
| MOLLISOLS | Aquolls | Haplaquolls | Cumulic Haplaquolls | coarse-loamy, mixed, frigid | Monache Variant |
| | Xerolls | Argixerolls | Typic Argixerolls | fine-loamy, mixed, thermic | Bohna Chualar family |
| | | | Ultic Argixerolls | fine-loamy, mixed, mesic | Brownlee family |
| | | | Typic Haploxerolls | | Typic Haploxerolls |
| | | Haploxerolls | | loamy-skeletal, mixed, thermic | Livermore family |
| | | | Cumulic Ultic Haploxerolls | coarse-loamy, mixed, frigid | Monache |
| | | | Entic Haploxerolls | sandy-skeletal, mixed, frigid loamy, mixed, mesic, shallow | Chesaw family Tollhouse |
| | | | Entic Ultic Haploxerolls | loamy, mixed, thermic, shallow loamy-skeletal, mixed, frigid | Tollhouse Var. Glean Variant |
| | | | Pachic Ultic Haploxerolls | loamy-skeletal, mixed, mesic coarse-loamy, mixed, mesic coarse-loamy, mixed, thermic | Woolstalf Junipero family Shaver Variant |
| | | | Ultic Haploxerolls | coarse-loamy, mixed, frigid coarse-loamy, mixed, mesic | Baldmountain Wind River fam. |

TABLE 6 -- KEY FOR SOIL IDENTIFICATION

[The symbol < means less than; > means more than]

| Soil Name | Parent material | | | | Depth cm | Diagnostic horizons | | | | | | | | | | Particle size class | | | | | Drain-age class | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|--------------------|----------|-------------|---------------------|--------------|--------------|--------------|--------|-------------|--------|----------|---|---|---------------------|----------------|-------|-------|--------------|-----------------|--------|-----------------|-----------------|---|--|
| | Metamorphic rock | Granitic rock | Basic igneous rock | Alluvium | | Epipedon | | | | | Sub-surface | | | | | Sandy-skeletal | Loamy-skeletal | Sandy | Loamy | Coarse-loamy | Fine-loamy | Poorly | Somewhat poorly | Moderately well | | |
| | | | | | | Mollic <50cm | Mollic >50cm | Umbric <50cm | Umbric >50cm | Ochric | None | Cambic | Argillic | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOILS OF THE LOWER MONTANE ZONE UNDER PINYON-JUNIPER WOODLAND OR SAGEBRUSH SCRUB PLANT COMMUNITIES (MESIC) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tollhouse | ● | ● | | | ● | | | | | | | | ● | | | | ● | | | | | | | | | |
| SOILS OF MONTANE MEADOWS AND MEADOW EDGES | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Typic Haploxerolls | | | | ● | | | | ● | | | | | | | | | | | ● | | | | | ● | | |
| Monache Variant | | | | ● | | | | | ● | | | | | ● | | | | | | | | | | | ● | |
| Monache Variant, drained | | | | ● | | | | | ● | | | | | | ● | | | | | | | | | ● | | |
| Monache | | | | ● | | | | | ● | | | | | | ● | | | | | | | | | ● | | |
| Junipero family | | | | ● | | | | | ● | | | | | | ● | | | | | | | | | ● | | |
| SOILS OF THE UPPER MONTANE AND SUBALPINE ZONES UNDER RED FIR FOREST, MONTANE CHAPARRAL, LODGEPOLE PINE FOREST, WHITE FIR FOREST, OR FOXTAIL-LIMBER PINE FOREST PLANT COMMUNITIES (FRIGID) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chumstick family | ● | | | | ● | | | | | | | | ● | | | | | ● | | | | | | | | |
| Baldmountain | ● | | | | | | | ● | | | | | | | | | | | ● | | | | | | | |
| Jumpe family | ● | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| Toem | | ● | | | ● | | | | | | | | ● | ● | | | | | ● | | | | | | | |
| Chesaw family | ● | ● | | | | | | ● | | | | | | | ● | | | | ● | | | | | | | |
| Nanny family | | ● | | | | | | | | | ● | | | | | | | | ● | | | | | | | |
| Sirretta | | ● | | | | | | | | | | | ● | ● | | | | | ● | | | | | | | |
| Cagwin | | ● | | | | | | | | | | | ● | ● | | | | | ● | | | | | | | |
| Kriest family | | ● | | | | | | | | | | | ● | | | | | | ● | | | | | | | |
| Cagwin Variant | | ● | | | | | | | | | | | ● | ● | | | | | ● | | | | | | | |
| Cannell | | ● | | | | | | | | | | | ● | | | | | | ● | | | | | | | |
| Glean Variant | | | ● | | | | | ● | | | | | | | ● | | | | ● | | | | | | | |

TABLE 6 -- KEY FOR SOIL IDENTIFICATION

[The symbol < means less than; > means more than]

| Soil Name | Parent material | | | | Depth cm | Diagnostic horizons | | | | | | | | | | Particle size class | | | | | | Drain-age class | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|--------------------|----------|-------------|---------------------|--------------|--------------|--------------|--------|-------------|--------|----------|---|---|---------------------|----------------|-------|-------|--------------|------------|-----------------|-----------------|-----------------|---|--|--|
| | Metamorphic rock | Granitic rock | Basic igneous rock | Alluvium | | Epipedon | | | | | Sub-surface | | | | | Sandy-skeletal | Loamy-skeletal | Sandy | Loamy | Coarse-loamy | Fine-loamy | Poorly | Somewhat poorly | Moderately well | | | |
| | | | | | | Mollic <50cm | Mollic >50cm | Umbric <50cm | Umbric >50cm | Ochric | None | Cambic | Argillic | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOILS OF THE FOOTHILL ZONE UNDER FOOTHILL WOODLAND OR MIXED CHAPARRAL PLANT COMMUNITIES (THERMIC) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Livermore family | ● | | | | | | ● | | | | | | ● | | | | ● | | | | | | | | | | |
| Chualar family | ● | | ● | | | | ● | | | | | | | | | | | | | ● | | | | | | | |
| Tollhouse Variant | | ● | | | | | ● | | | | | | ● | | | | | | | | | | | | | | |
| Cieneba | | ● | | | | | ● | | | | | ● | | ● | | | | | | | | | | | | | |
| Chawanakee Variant | | | | | | | ● | | | | | ● | | | ● | | | | | | | | | | | | |
| Millerton family | | ● | | | | | ● | | | | | ● | | | | | | | | ● | | | | | | | |
| Shaver Variant | | ● | | | | | | | ● | | | | ● | | ● | | | | | | | | | | | | |
| Kanaka family | | ● | | | | | ● | | | | | ● | | | ● | | | | | ● | | | | | | | |
| Bohna | | ● | | | | | ● | | | | | | | | | | ● | | | | | | | | | | |
| Auberry | | | | | | | | | | | | ● | | | | | ● | | | | | | | | ● | | |
| SOILS OF THE LOWER MONTANE ZONE UNDER YELLOW PINE FOREST, MONTANE CHAPARRAL, WHITE FIR FOREST, OR MIXED CONIFER FOREST PLANT COMMUNITIES (MESIC) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hotaw Variant | ● | | | | | | ● | | | | | ● | | | | | ● | | | | | | | | ● | | |
| Wind River family | ● | | | | | | ● | | | | | | | | | | | | | ● | | | | | | | |
| Woolstalf | ● | | | | | | | | ● | | | | | | | ● | | | | ● | | | | | | | |
| Brownlee family | ● | | | | | | ● | | | | | | | | | | | | | | | | | ● | | | |
| Chawanakee | | ● | | | | | ● | | | | | ● | | | | | | | | ● | | | | | | | |
| Chaix | | ● | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| Hotaw | | ● | | | | | | | | | | ● | | | | | | | | | | | | ● | | | |
| Shaver | | ● | | | | | | | | | | | ● | | ● | | | | | | | | | ● | | | |
| Dome | | ● | | | | | | | | | | ● | | | | | | | | | | | | ● | | | |
| Holland | | ● | | | | | | | | | | ● | | | | | | | | | | | | ● | | | |
| Crozier | | | ● | | | | | | | | | ● | | | | | | | | | | | | ● | | | |
| Boomer | | | ● | | | | | | | | | ● | | | | | | | | | | | | ● | | | |

Table 7. - Laboratory and Field Analysis for Selected Soils

[Absence of an entry indicates that the soil was not rated]

| Soil Name | Depth (inches) | Horizon | Percentage of base saturation | | Percentage of organic carbon | | |
|----------------|-------------------|---------------|----------------------------------|--------|---------------------------------|------|--------------|
| | | | NSSL (1) | | Hach Kit | NSSL | La Motte Kit |
| | | | Sum | NH40AC | (2) | (1) | (3) |
| Auberry | 14-21 | B21t | | | 60 | | |
| | 21-30 | B22t | | | 63 | | |
| | 30-41 | B23t | | | 69 | | |
| Baldmountain | 0-8 | A1 | 45 | 56 | 58 | | 1.60 |
| | 3-8 | B21 | 63 | 69 | 69 | 0.53 | |
| | 21-35 | B22 | | | 83 | | |
| Bohna | 0-8 | A11/ A12 | 85 | 100 | 84 | 2.46 | 3.77 |
| | 8-19 | B1 | 80 | 98 | 92 | 0.79 | 1.21 |
| | 19-36 | B21t | | | 82 | | |
| Boomer | 13-19 | B21t | | | 67 | | |
| | 19-25 | B22t | | | 74 | | |
| Brownlee fam | 0-7 | A11 | | | 58 | | |
| | 7-15 | A12 | | | 63 | | |
| Cagwin | 3-9 | A12 | | | 25 | | |
| | 9-27 | A13 | | | 0 | | |
| Cannell | 0-7 | A1 | 55 | 57 | | 0.47 | 0.63 |
| | 7-27 | B2 | 75 | 83 | | | |
| Chaix | 11-26 | B22 | | | 50 | | |
| Chawanakee Var | 7-18 | B2 | | | 56 | | |
| Chesaw family | 0-16 | A1 | | | 75 | | |
| Chualar fam | 9-29 | B21t/ B22t | | | 83 | | |
| Dome | 7-28 | B2 | | | 55 | | |
| Kanaka family | 9-19 | B2 | | | 63 | | |
| | 19-26 | C1 | | | 57 | | |
| Kriest family | 5-14 | B1 | | | 27 | | |
| | 14-33 | B2 | | | 42 | | |
| Nanny family | 0-6 | A1 | | | 31 | | 3.90 |
| | 6-16 | B21 | 37 | 49 | 37 | 1.42 | 1.45 |
| Shaver | 0-4 | A11 | | | 44 | | |
| | 4-14 | A12 | | | 61 | | |
| | 14-43 | A13 | | | 55 | | 2.38 |
| Shaver Variant | 0-4 | A11 | | | 67 | | |
| | 4-8 | A12 | | | 60 | | |
| | 8-20 | B21 | | | 57 | | |
| Sirretta | 0-6 | A1 | | | 35 | | |
| Tollhouse Var | 0-5 | A11 | | | 67 | | |
| | 5-11 | A12 | | | 71 | | |
| Wind River fam | 0-12 | A1 | 67 | 80 | 68 | 1.58 | 2.24 |
| | 12-22 | B2 | 72 | 81 | 69 | 1.06 | |
| | 22-33 | B3 | 77 | 88 | 75 | | |

| Soil Name | Depth (inches) | Horizon | Percentage of base saturation | | | Percentage of organic carbon | |
|-----------|-------------------|---------|----------------------------------|--------|----------|---------------------------------|--------------|
| | | | NSSL (1) | | Hach Kit | NSSL | La Motte Kit |
| | | | Sum | NH40AC | (2) | (1) | (3) |
| Woolstalf | 0-6 | A11 | 46 | 61 | 54 | | |
| | 6-15 | A12 | 45 | 58 | 55 | | |
| | 10 | | | | | 3.30 | 5.28 |
| | 20 | | | | | 1.51 | 2.26 |
| | 15-27 | A13 | | | 53 | | |

¹ Soil Conservation Service, National Soil Survey Laboratory, Lincoln, NE

² Soil Analysis Kit, Model SA2, Hach Chemical Company.

³ La Motte Organic Matter Outfit, Model ST-1001-OR.

Table 8. - Soil Component Area and Proportionate Extent

| Component Name | Acres | Percent of Total |
|--------------------------------|--------------|-----------------------------|
| Auberry | 45,066 | 3.3 |
| Baldmountain | 13,526 | 1.0 |
| Bohna | 13,440 | 1.0 |
| Boomer | 3,499 | 0.3 |
| Brader family | 16,047 | 1.1 |
| Brownlee family | 5,570 | 0.4 |
| Cagwin | 67,614 | 5.0 |
| Cagwin Variant | 3,627 | 0.3 |
| Cannell | 41,710 | 3.1 |
| Chaix | 83,117 | 6.1 |
| Chawanakee | 43,853 | 3.3 |
| Chawanakee Variant | 736 | * |
| Chesaw family | 5,587 | 0.4 |
| Chualar family | 19,652 | 1.4 |
| Chumstick family | 460 | * |
| Cieneba | 83,164 | 6.1 |
| Crozier | 450 | * |
| Dome | 49,304 | 3.6 |
| Glean Variant | 3,963 | 0.3 |
| Gullied land | 163 | * |
| Holland | 32,699 | 2.4 |
| Hotaw | 14,658 | 1.1 |
| Hotaw Variant | 3,536 | 0.3 |
| Jumpe family | 4,673 | 0.3 |
| Junipero family | 3,232 | 0.3 |
| Kanaka family | 2,871 | 0.2 |
| Kriest family | 6,603 | 0.5 |
| Livermore family | 9,321 | 0.7 |
| Millerton family | 2,179 | 0.2 |
| Monache | 17,304 | 1.3 |
| Monache Variant | 899 | * |
| Monache Variant, drained | 10,692 | 0.8 |
| Monache Variant, drained, warm | 2,982 | 0.2 |
| Nanny family | 23,220 | 1.7 |
| Riverwash | 1,076 | 0.2 |
| Rock outcrop | 465,366 | 34.2 |
| Rubble land | 1,374 | 0.1 |
| Shallow soils | 1,379 | 0.1 |
| Shaver | 8,186 | 0.6 |
| Shaver Variant | 662 | * |
| Sirretta | 51,747 | 8.0 |
| Siskiyou family | 22,222 | 1.6 |

| Component Name | Acres | Percent of Total |
|---------------------------|--------------|-----------------------------|
| Toem | 85,971 | 6.3 |
| Tollhouse | 45,340 | 3.4 |
| Tollhouse Variant | 1,307 | 0.1 |
| Typic Haploxerolls | 999 | * |
| Wind River family | 9,099 | 0.7 |
| Woolstalf | 16,961 | 1.3 |
| Xerofluvents | 6,099 | 0.5 |
| Xerorthents | 5,792 | 0.4 |
| Total | 13,606,853 | 100.0 |

* Less than 0.1%.

Taxonomic Unit Descriptions

In this section, each soil recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified. A pedon, a small three-dimensional area of soil, that is typical of the soil in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (12). unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of

the soil. The soil is compared with other soils in the same taxonomic family and with soils in other closely related families. The soil is also compared with other soils that are associated geographically.

The map units of each soil are listed in Table 2 and are described in the section "Detailed soil map units."

Table 8 lists the area of each soil and map unit component, and identifies its proportionate extent of the survey area.

AUBERRY SERIES

The Auberry series consists of deep, well drained soils on foothills, canyon sides, and mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 10 to 75 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 1,600 to 5,000 feet. The average annual precipitation is 16 to 40 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are fine-loamy, mixed, thermic Ultic Haploxeralfs.

Typical pedon of Auberry series in a unit of Rock outcrop-Auberry-Kanaka family association, steep, in Sequoia National Forest, Tulare County, Tule River Ranger District; on east side of dirt road, 60 steps north of bunkers which are 0.2 miles north of Highway 190; dirt road services pipeline and is 0.6 miles east of Coffee Camp Campground; in the NW1/4, NW1/4 of sec. 28, T.20S., R.30E.

01-2 inches to 0; annual grass and oak litter mixed with soil material.

A1-0 to 7 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores and few very fine tubular pores; medium acid; gradual smooth boundary.

A3-7 to 14 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and common medium roots; many very fine interstitial pores, common very fine and fine tubular pores, and few medium tubular pores; medium acid; gradual smooth boundary.

B21t-14 to 21 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and coarse roots; many very fine interstitial pores and common very fine and medium tubular pores; very few thin clay films as bridges between mineral grains, common colloid stains on mineral grains; medium acid; clear smooth boundary.

B22t-21 to 30 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium and coarse roots; many very fine tubular

pores and common fine and medium tubular pores; common thin reddish brown (5YR 5/3) clay films in pores and common moderately thick reddish brown (5YR 5/3) clay films on faces of peds; medium acid; gradual smooth boundary.

B23t-30 to 41 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; moderate medium and coarse subangular blocky structure; hard, friable, slightly sticky and plastic; few fine roots; common very fine and few fine tubular pores; common moderately thick reddish brown (5YR 5/3) clay films on faces of peds and few thin clay films lining tubular pores; medium acid; clear smooth boundary.

Cr-41 inches; reddish yellow (7.5YR 6/6) weathered granitic materials that has relic rock structure; thin and moderately thick reddish brown (5YR 4/4) clay films in joints.

Range in Characteristics: Depth to a paralithic contact is 40 to 70 inches. The profile ranges from 0 to 10 percent gravel. It is slightly acid or medium acid.

The A1 horizon has dry color of 10YR or 7.5YR 5/3, 5/4, or 6/3 and moist color of 10YR or 7.5YR 3/2, 3/3, 4/3, or 4/4. It is coarse sandy loam, sandy loam, or loam. The A1 horizon ranges from 15 to 18 inches in thickness.

The B2t horizon has dominant dry colors of 10YR or 7.5YR. 4/3, 4/4, 5/3, 5/4, 5/6, 6/3, or 6/4 and moist color of 10YR or 7.5YR. 3/3, 3/4, 3/6, 4/3, 4/4, or 4/6. In some areas the color ranges to 5YR. The B2t horizon is clay loam or sandy clay loam. The base saturation ranges from 60 to 69 percent.

Competing soils: These are the Bohna, Boomer, Brownlee family, Chualar family, Crozier, Holland, and Hotaw soils in other families. Bohna soils have a mollic epipedon. Boomer, Brownlee family, Crozier, Holland and Hotsaw soils occur in the montane coniferous forest communities of Yellow Pine Forest and White Fir Forest. Boomer soils formed in basalt. Brownlee family soils formed in metamorphic rock. Chualar family soils are moderately deep and formed in metamorphic rock. Crozier soils are moderately deep and formed in basalt. Hotaw soils are moderately deep.

Geographically associated soils: These are the Cieneba, Kanaka family, Millerton family, Shaver Variant, and Tollhouse Variant soils, and the competing Holland soils. Cieneba soils do not have an argillic horizon and are shallow. Tollhouse Variant and Shaver Variant soils have

a mollic epipedon and do not have an argillic horizon. Tollhouse Variant soils are shallow. Kanaka family soils do not have an argillic horizon and are moderately deep.

Millerton family soils are shallow and lithic.

BALDMOUNTAIN SERIES

The Baldmountain series consists of deep, well drained soils on mountain sides. These soils formed in residuum derived from metamorphic and metasedimentary rock. Slope ranges from 5 to 75 percent. The main plant communities are Yellow Pine Forest dominated by Jeffrey pine, Red Fir Forest, White Fir Forest, and Montane Chaparral. The elevation is 6,790 to 10,000 feet. The average annual precipitation is 18 to 39 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are coarse-loamy, mixed, frigid Ultic Haploxeroils.

Typical pedon of Baldmountain series in a unit of Baldmountain Rocky outcrop-Jumpe family complex, 30 to 50 percent slopes; in Tulare County, California; Sequoia National Forest, Cannell Meadow Ranger District; from intersection of Forest Service roads 22S77 and 35EO8, 0.4 miles south on 35EO8 to a spur road, and 1.5 miles west on spur road; about 40 feet west of roadcut; in the SE1/4 of sec. 3, T.22S., R.34E.

01-1 inch to 0; layer of dead and decomposing needles and twigs.

A1-0 to 8 inches; brown (7.5YR 5/4) silt loam, dark brown (7.5YR 3/2) moist; moderate medium and fine subangular blocky structure and moderate fine granular structure; slightly hard, friable, slightly sticky fine sticky and plastic; common fine and very fine roots; common very fine tubular and interstitial pores; 5 percent pebbles; neutral; clear smooth boundary.

B21-8 to 21 inches; brown (7.5YR 4/4) silt loam, dark brown (7.5YR 3/3) moist, moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common medium, fine, and very fine roots; common very fine tubular pores; 10 percent pebbles; neutral; gradual smooth boundary.

B22-21 to 35 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable; slightly sticky and plastic; many coarse and medium roots; common very fine tubular pores; 10 percent pebbles; neutral; clear smooth boundary.

C1-35 to 57 inches; yellowish brown (10YR 5/4) loam,

dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many coarse and medium roots; common very fine tubular pores; 10 percent pebbles; neutral; gradual smooth boundary.

C2r-51 inches; weathered metasedimentary material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 40 to 60 inches. The profile ranges from 5 to 30 percent gravel. It is silt loam or loam and is less than 18 percent clay. The profile is slightly acid or neutral. Organic carbon content is 0.5 percent in the lower part of the B21 horizon.

The A1 horizon has dry color of 7.5YR if 10YR 4/2, 4/3, 4/4, 5/2, 5/3, or 5/4 and moist color of 7.5YR or 10YR 3/2 or 3/3.

The B21 horizon has dry color of 7.5YR or 10YR 4/3, 4/4, 5/4, or 5/3, or and moist color of 7.5YR or 10YR 3/2 or 3/3.

The B22 horizon has dry color of 7.5YR or 10YR 4/4, 5/4, 6/3, or 6/4 and moist color of 7.5YR or 10YR 3/4, 4/3, or 4/4.

The C1 horizon has dry color of 7.5YR or 10YR 5/4 or 5/6, and moist color of 7.5YR or 10YR 4/4, 4/6, 5/4, or 5/6.

Competing soils: These are the Junipero family and Shaver soils, Typic Haploxerolls, and Wind River family soils in other families. Typic Haploxerolls soils are formed in alluvium associated with meadows and are moderately well drained. Shaver and Junipero family soils are pachic and occur in Yellow Pine Forest dominated by ponderosa pine. Wind River family soils occur in Yellow Pine Forest dominated by ponderosa pine and mixed Conifer Forest.

Geographically associated soils: These are the Cagwin, Cannell, Nanny family, and Woolstalf soils, and the competing Wind Family soils. Cagwin soils are moderately deep, have an ochric epipedon, and are sandy. Cannell soils have an ochric epipedon and formed in granite. Nanny family soils have an umbric epipedon, are loamy skeletal, and formed in granite. Woolstalf soils are pachic and loamy-skeletal.

BOHNA SERIES

The Bohna series consists of deep, well drained soils on foothills and mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 2,300 to 5,800 feet. The average annual precipitation is 18 to 40 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are fine-loamy, mixed, thermic, Typic Argixerolls.

Typical pedon of Bohna series in a unit of Bohna loam, 5 to 30 percent slopes, in Kern County, California; Sequoia National Forest, Greenhorn Ranger District; 100 feet north of Forest Service road 25S04, about 0.3 miles south of the intersection with Highway 155; in the NW1/4, NE1/4 sec. 26, T.25S., R.31E.

01-2 inches to 0; decomposed oak and grass litter.

A11-0 to 4 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, nonsticky and slightly plastic; many very fine roots; many very fine tubular pores; neutral wavy boundary.

A12-4 to 8 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, nonsticky and slightly plastic; many fine roots; many very fine tubular pores; neutral; gradual wavy boundary.

B1-8 to 18 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium and common very fine roots; common fine tubular pores; neutral; gradual wavy boundary.

B21t-18 to 36 inches; strong brown (7.5YR 5/6) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common fine tubular pores; few

thin clay bridges between mineral grains and few thin clay films lining tubular pores and on faces of peds; neutral; gradual wavy boundary.

B22t-36 to 44 inches; strong brown (7.5YR 5/6) sandy clay loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common moderately thick and thin yellowish red (5YR 5/6) clay bridges between mineral grains; slightly acid; diffuse irregular boundary.

Cr-44 inches; yellowish red (7.5YR 5/6 and 4/6) weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 40 to 60 inches. The mollic epipedon ranges from 10 to 19 inches in thickness.

The A1 horizon has dry color of 10YR or 7.5YR 5/2, 5/3, or 5/4 and moist color of 10YR or 7.5YR 3/2 or 3/3. It is loam or sandy loam. The A1 horizon is neutral or slightly acid.

The B2t horizon has dry color of 10YR or 7.5YR 4/4, 4/6, 5/4, 5/6, 6/4, or 6/6 and moist color of 10YR or 7.5YR 4/7, 5/4, or 5/6. It is sandy clay loam or clay loam. The B2t horizon is neutral or slightly acid.

Competing soils: These are the Chualar family soils in the same family, and the Auberry, Boomer, Brownlee family, Crozier, and Holland soils in other families. Chualar family soils are moderately deep over basic igneous rock. Auberry soils have an ochric epipedon. Boomer and Crozier soils have an ochric epipedon, formed in basalt, and occur in the montane coniferous forest communities of Yellow Pine Forest and White Fir Forest. Brownlee family soils formed in metamorphic rocks. Holland soils have an ochric epipedon. Brownlee family and Holland soils are in montane coniferous forest communities.

Geographically associated soils: These are the competing Auberry and Holland soils, and the Cienega soils. Cienega soils are shallow and have an ochric epipedon.

BOOMER SERIES

The Boomer series consists of deep, well drained soils on mountain sides. These soils formed in residuum derived from basalt. Slope ranges from 5 to 40 percent. The main plant communities are White Fir Forest, Yellow Pine Forest, Montane Chaparral and Mixed Conifer Forest. The elevation is 4,800 to 6,600 feet. The average annual precipitation is 30 to 40 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical pedon of Boomer series in a unit of Boomer-Crozier-Rock outcrop complex, 5 to 40 percent slopes; in Fresno County, California, Sequoia National Forest, Hume Lake Ranger District, on the north side of Forest Service road 13S07 approximately 0.5 miles north of the intersection of Highway 180 and Forest Service road 13S07; in the NE1/4 of sec. 9, T.13S., R.28E.

01-1 inch to 0; partially decomposed needle, leaf, and twig litter.

A1-0 to 7 inches; reddish brown (5YR 5/3) gravelly loam, dark reddish brown (5YR 3/2) moist; moderate fine granular structure; slightly hard, friable, nonsticky and slightly plastic; many very fine, and medium roots; common fine interstitial pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B1t-7 to 13 inches; reddish brown (5YR 5/4) sandy loam, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine, fine, and medium root; common fine tubular pores; few thin clay films as bridges between mineral grains; few stains on mineral grains; 5 percent pebbles; medium acid; gradual smooth boundary.

B21t-13 to 19 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine roots; common fine tubular pores; few thin clay films as bridges between mineral grains; few stains on mineral grains; 5 percent pebbles; medium acid; gradual smooth boundary.

B22t-19 to 25 inches; light reddish brown (5YR 6/4) clay loam, reddish brown 5YR 4/3) moist; moderate medium and fine subangular blocky struc-

ture; slightly hard, friable, sticky and plastic; common fine and medium roots; common fine tubular pores; few thin clay films on faces of peds and as bridges between mineral grains; few stains on mineral grains; 5 percent pebbles; medium acid; gradual smooth boundary.

B23t-25 to 35 inches; light reddish brown (5YR 6/4) cobbly clay loam, reddish brown (5YR 4/3) moist; moderate medium and fine subangular blocky structure; hard, friable, sticky and plastic; few fine and medium roots; few fine tubular pores; few thin clay films on faces of peds and as bridges between mineral grains; few stains on mineral grains; 10 percent cobbles and 10 percent pebbles; medium acid; gradual smooth boundary.

B3t-35 to 50 inches; yellowish red (5YR 4/6) sandy loam, dark reddish brown (5YR 3/4) moist; massive; hard, firm, sticky and plastic; few fine and medium roots; few fine tubular pores; few thin clay films as bridges between mineral grains; few stains on mineral grains; medium acid.

Range in characteristics: Depth to a paralithic contact is 40 to 80 inches. The profile ranges from 5 to 35 percent gravel and cobbles.

The A1 horizon has dry color of 5YR 5/3 or 5/4 and moist color of 5YR or 2.5YR 3/2, 3/3, or 3/4. The A1 horizon ranges from 7 to 9 inches in thickness.

The B2t horizon has dry color of 5YR 4/4, 4/6, 5/4, 5/6, or 6/4 and moist color of 5YR or 2.5YR 3/4, 3/6, 4/3, 4/4, or 4/6.

Competing soils: These are the Crozier, Holland, and Hotaw soils in the same family, and the Auberry and Brownlee family soils in other families. Crozier soils are moderately deep and have a hue of 7.5YR. Holland soils have a hue of 7.5YR or 10YR and formed in granitic rock. Hotaw soils do not have a hue redder than 7.5 YR, are moderately deep, and formed in granite. Auberry soils have a hue of 7.5YR or 10YR and are in areas of Foothill Woodland and Mixed Chaparral. Brownlee family soils have a mollic epipedon and do not have a hue redder than 5YR.

Geographically associated soils: These are the Chaix, Chawanakee, and Dome soils, and the competing Crozier soils. Chaix, Chawanakee, and Dome soils do not have an argillic horizon and are coarse-loamy.

BRADER FAMILY

The Brader family consists of shallow, somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slopes range from 2 to 75 percent. The main plant communities are Montane Chaparral and Sagebrush Scrub. The elevation is 2,200 to 5,000 feet. The average annual precipitation is 8 to 25 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are loamy, mixed, mesic, shallow Typic Xerochrepts

Typical pedon of Brader family soil in a unit of Rock outcrop-Brader-Siskiyou families complex, 20 to 60 percent slopes; in Tulare County, California, Sequoia National Forest, Cannell Meadow Ranger District; in the NW1/4, SE1/4 of sec. 16, T. 35E.

A1-0 to 6 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very fine roots; many very fine tubular pores; 15 percent pebbles; neutral; clear smooth boundary.

B2-6 to 16 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few fine tubular pores; 15 percent pebbles; neutral; abrupt smooth boundary.

Cr-16 inches; highly weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 8 to 20 inches. The profile is coarse sandy loam, gravelly coarse sandy loam, sandy loam, or gravelly sandy loam. It ranges from 5 to 30 percent gravel. The profile is slightly acid or neutral.

The A horizon has dry color of 10YR 4/2, or 5/3 and moist color of 10YR 3/2 or 3/3. The horizon ranges from 3 to 6 inches in thickness.

The B2 horizon has dry color of 10YR 6/4 or 5/3 and moist color of 10YR 3/3, 4/3, or 4/4.

Competing Soils: These are the Chaix, Chawanakee, Dome, and Siskiyou family soils in other families. The Chaix, Chawanakee, and Dome soils occur in areas that have a mean annual precipitation of more than 26 inches and have base saturation of less than 60 percent in some part below a depth of 10 inches. Chaix soils are moderately deep, and Dome soils are deep. Siskiyou family soils are moderately deep.

Geographically associated soils: These are the Cieneba and Tollhouse family soils, and the competing Chaix, Dome, and Siskiyou family soils. The Cieneba soils are thermic and do not have a cambic horizon. The Tollhouse soils have a mollic epipedon and do not have a cambic horizon.

BROWNLEE FAMILY

The Brownlee family consists of deep, well drained soils on mountain sides and ridges. These soils formed in residuum derived from metamorphic or metasedimentary rock. Slope ranges from 30 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 3,900 to 7,200 feet. The average annual precipitation is 30 to 40 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Argixerolls.

Typical pedon of Brownlee family in a unit of Hotaw Variant-Brownlee family-rock outcrop complex, 40 to 75 percent slopes; in Tulare County, California; Sequoia National Forest, Hume Lake Ranger District; on north side of Forest Service Road 14S42 approximately 1.2 miles east of intersection of Forest roads 14S43 and 14S42; in the SW1/4 sec. 18, T.14S., R.28E.

01-1 inch to 0; partially decomposed forest litter.

A11-0 to 7 inches; brown (10YR 5/3) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure, and medium and fine granular structure; slightly hard, friable, nonsticky and slightly plastic; common fine and very fine roots; common very fine tubular pores; medium acid; clear smooth boundary.

A12-7 to 15 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure, and medium and fine granular structure; slightly hard, firm, nonsticky and slightly plastic; common fine and very fine roots; common very fine tubular pores; slightly acid; clear wavy boundary.

B21t-15 to 25 inches; yellowish brown (10YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; very few thin clay films as bridges between mineral grains; slightly acid; gradual smooth boundary.

B22t-25 to 35 inches; yellowish brown (10YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium and fine subangular blocky structure; hard, firm, slightly sticky and plastic; common fine and medium roots; common very fine tubular pores;

few moderately thick and medium roots; few moderately thick clay films on faces of pedis; slightly acid; gradual smooth boundary.

B23t-35 to 48 inches; yellowish brown (10YR 5/6) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium and fine subangular blocky structure; hard, firm, slightly sticky and plastic; common fine and medium roots; common very fine tubular pores; common moderately thick clay films on faces of pedis; slightly acid; gradual smooth boundary.

B3-48 to 65 inches; brownish yellow (10YR 6/6) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few very fine tubular pores; slightly acid; clear wavy boundary.

Cr-65 inches; interbedded soft to hard metamorphic rock that is nearly vertically tilted.

Range in characteristics: Depth to a paralithic contact is 60 to 65 inches.

The A1 horizon has dry color of 10YR 5/3 or 7.5YR 4/2 and moist color of 10YR or 7.5YR 3/2. The horizon is very fine sandy loam. It is medium acid or slightly acid. The A1 horizon ranges from 10 to 17 inches in thickness.

The B2t horizon has dry color of 10YR or 7.5YR 5/4 or 5/6 and moist color of 7.5YR 4/4 or 5YR 3/4. The horizon is sandy clay loam or loam.

Competing soils: These are the Bohna, Chualar family, Boomer, Crozier, Holland, and Hotaw soil in other families. Bohna soils formed in granite and occur under Foothill Woodland and Mixed Chaparral. Chualar family soils are moderately deep, formed in granite, and occur under Mixed Chaparral, Inland Closed-cone Coniferous Woodland, and Pinyon-Juniper Woodland. Boomer soils have an ochric epipedon and a hue of 5YR and 2.5YR. Crozier soils are moderately deep and have an ochric epipedon. Holland soils have an ochric epipedon and formed in granite. Hotaw soils are moderately deep and have an ochric epipric epipedon, and formed in granite.

Geographically associated soils: These are the Hotaw Variant and Shaver soils, and the competing Chualar family and Holland soils. Hotaw Variant soils are moderately deep. Shaver soils have a thick umbric epipedon and do not have an argillic horizon.

CAGWIN SERIES

The Cagwin series consists of moderately deep, somewhat excessively drained soils on mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Red Fir Forest, Lodgepole Pine Forest, White Fir Forest, Yellow Pine Forest dominated by Jeffrey pine, and Montane Chaparral. The elevation is 6,400 to 8,500 feet. The average annual precipitation is 30 to 50 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are mixed, frigid Dystric Xeropsamments.

Typical pedon of Cagwin series in a unit of Cagwin-Toem-Rock outcrop complex, 30 to 50 percent slopes; in Tulare County, California; Sequoia National Forest, Cannell Meadow Ranger District; from the intersection of Foest Service road 20S25 and Osa Creek, 1.2 miles north to ridgetop on west side of road; in the NW1/4 sect. 16, T.20S., R.34E.

01-2 inches to 0; forest duff; dead and decomposing needles, twigs, bark, and cones.

A1-0 to 7 inches; brown (10YR 5/3) loamy sand, very dark grayish brown (10YR 3/2) moist; moderate medium and fine granular structure; soft, very friable, nonsticky and slightly plastic; common medium, fine, and very fine roots; common fine tubular pores; 5 percent pebbles; strongly acid; clear smooth boundary.

AC-7 to 13 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; weak fine and very fine granular structure; soft, very fine roots; common

fine tubular pores; 8 percent pebbles; medium acid; clear smooth boundary.

C1-13 to 34 inches; pale brown (10YR 6/3) loamy coarse sand, brown (10YR 5/3) moist; single grain; loose; common medium and coarse roots; many fine interstitial pores; 15 percent pebbles; medium acid; gradual smooth boundary.

C2r-34 inches; highly weathered granitic material that has rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 40 inches. The profile ranges from 5 to 25 percent gravel and cobbles. It is medium acid or strongly acid.

The A horizon has dry color of 10YR 4/2, 4/3, 5/2, or 5/3 and moist color of 10YR 3/2, 3/3, 4/2, or 4/3. The horizon is loamy sand or loamy coarse sand. It ranges from 5 to 9 inches in thickness.

The C horizon has dry color of 10YR 6/2, 6/3, 6/4, 7/2, 7/3, or 7/4 and moist color of 10YR 4/2, 4/3, 4/4, 5/2, 5/4, 6/2, 6/3, or 6/4.

Competing soils: These are the Cagwin Variant soils in the same family, and the Cannell, Kriest family, and Toem soils in other families. Cagwin Variant soils are deep. Cannell soils are deep, have a cambic horizon, and are coarse-loamy. Toem soils are shallow.

Geographically associated soils: These are the Nanny family and Sirretta soils, and the competing Cagwin Variant, Cannell, and Toem soils. Nanny family soils have an umbric epipedon, are deep, and are loamy-skeletal. Sirretta soils are sandy-skeletal.

CAGWIN VARIANT

The Cagwin Variant consists of deep, excessively drained soils on the toe slopes of mountains and on alluvial fans adjacent to upland basins. The soils formed in alluvium derived from granitic rock. Slope ranges from 0 to 15 percent. The main vegetation is occasional montane forbs and lodgepole pine. The elevation is 7,500 to 8,500 feet. The average annual precipitation is 16 to 24 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are mixed, frigid Dystric Xeropsamments.

Typical pedon of Cagwin Variant in a unit of Cagwin Variant loamy coarse sand, 5 to 15 percent slopes; in Sequoia National Forest, Hot Springs District, Tulare County, California, 1/4 of a mile on road to Sand Flat from the junction with Forest Highway 90 above Frog Meadow Station; in the NE1/4, NE1/4 sec. 1, T.24S., R.31E.

A1-0 to 4 inches; dark yellowish brown (10YR 4/4) loamy coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; many medium and coarse roots; many very fine interstitial pores; slightly acid; clear smooth boundary.

C1-4 to 10 inches; light brownish gray (10YR 6/2) gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose; many medium and coarse roots; many very fine interstitial pores; 15 percent pebbles; slightly acid; gradual smooth boundary.

C2-10 to 60 inches; pale brown (10YR 6/3) gravelly loamy coarse sand, brown (10YR 5/3) moist; single grain; loose; few coarse roots; many very fine interstitial pores; 20 percent pebbles; slightly acid.

Range in characteristics: The solum ranges from 4 to 10 inches in thickness. The profile ranges from 5 to 20 percent gravel. It is slightly acid or medium acid.

The A horizon has dry color of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4, 6/2, 6/3, or 6/4 and moist color of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, or 4/4. The horizon ranges from 4 to 8 inches in thickness.

The C horizon has dry color of 10YR 6/2, 6/3, 6/4, 7/2, 7/3, 7/4 8/2, 8/3, or 8/4 and moist color of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 6/2, 6/3, or 6/4.

Competing Soils: These are the Cagwin soils in the same family, and the Cannell, Kriest family, and Toem soils in other families. Cagwin soils are moderately deep. Cannell and Kriest family soils have a cambic horizon and are coarse-loamy. Toem soils are shallow.

Geographically associated soils: These are the Nanny family and Sirretta soils, and the competing Cagwin, Cannell, and Toem soils. Nanny family soils have an umbric epipedon and are loamy-skeletal. Sirretta soils are moderately deep and are sandy-skeletal.

CANNELL SERIES

The Cannell series consists of deep, well drained soils on mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Red Fir Forest, White Fir Forest, Lodgepole Pine Forest, Yellow Pine Forest dominated by Jeffrey pine, and Montane Chaparral. The elevation is 7,000 to 9,000 feet, and the average annual precipitation is 25 to 50 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are coarse-loamy, mixed, frigid Dystric Xerochrepts.

Typical pedon of Cannell series in a unit of Cannell-Sirretta Nanny family complex, 5 to 30 percent slopes; in Tulare County, California; Sequoia National Forest; Cannell Meadow Ranger District; approximately 15 miles north of Blackrock Station on Forest Service Road 21S03, on the west side of road; in the NW1/4 sec. 12, T.21S., R.34E.

O1-2 inches to 0; forest duff of dead and decomposing pine needles, twigs, and bark.

A1-0 to 7 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure and moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very tubular and interstitial pores; 10 percent pebbles; medium acid; clear smooth boundary.

B2-18 to 27 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots and many medium and coarse roots; common fine and very fine tubular pores; 10 percent pebbles; strongly acid; gradual smooth boundary.

C1-27 to 50 inches; yellowish brown (10YR 5/4) sandy loam, dark brown (10YR 4/3) moist; weak coarse and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots and many medium and coarse roots; common fine and very fine tubular pores; strongly acid; gradual smooth boundary.

C2r-50 inches; highly weathered granitic rock that has mineral grains retaining original orientation.

Range in characteristics: The solum ranges from 20 to 35 inches in thickness, and the depth to rock is 40 to 59 inches. The profile ranges from 5 to 20 percent gravel. It is coarse sandy loam or sandy loam and is less than 18 percent clay. Mollic colors do not extend below a depth of 8 inches.

The A horizon has dry color of 10YR 4/2, 4/3, 5/2, or 5/3 and moist color of 10YR 3/2, 3/3, 4/2, or 4/3.

The B2 horizon has dry color of 10YR 5/3, 5/4, or 6/2 and moist color of 10YR 3/2, 3/4, or 5/3.

Competing soils: These are the Kriest family soils in the same family, and the Cagwin Variant, Dome, and Nanny family soils in other families. Kriest family soils are moderately deep. Cagwin Variant soils are sandy. Dome soils occur in the lower montane communities of Yellow Pine Forest dominated by ponderosa pine, and White Fir Forest. Nanny family soils are loamy-skeletal.

Geographically associated soils: These are the Cagwin, Monache, Monache Variant and Sirretta soils, and the competing Kriest family soils. Cagwin soils are sandy and moderately deep. Monache soils and Monache Variant, drained soils have a mollic epipedon and occur in meadows. Sirretta soils are moderately deep and are sandy-skeletal.

CHAIX SERIES

The Chaix series consists of moderately deep, well drained and somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 6,000 to 9,000 feet. The average annual precipitation is 20 to 50 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Dystric Xerochrepts.

Typical pedon of Chaix series in a unit of Rock outcrop-Chawanakee-Chaix complex, 30 to 50 percent slopes; in Tulare County, California; Sequoia National Forest, Cannell Meadow Ranger District; approximately 0.2 miles west of intersection of Forest Service road 24S13 and Bartolas road, on 24S13 and 50 feet south of road; in the SW1/4SE1/4 Sec. 26, T.24S., R.34WE.

A1-0 to 7 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate medium and fine granular; slightly hard, very friable, non-sticky and slightly plastic; common fine and very fine roots; common very fine tubular and interstitial pores; 10 percent pebbles; slightly acid; clear smooth boundary.

B2-7 to 25 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine and fine roots and many medium and coarse roots; common very fine, fine, fine and medium tubular

pores; 10 percent pebbles; slightly acid; abrupt smooth boundary.

Cr-25 inches; weathered granitic rock that has mineral grains retaining original rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 40 inches. The profile is sandy loam and coarse sandy loam. It ranges from 5 to 25 percent gravel.

The A horizon has dry color of 10YR 4/2, 4/3, or 5/3 and moist color of 10YR 3/2, 3/3, or 3/4. The horizon ranges from 5 to 9 inches in thickness.

The B horizon has dry color of 10YR 5/3, 5/4, 6/3, or 6/4 and moist color of 10YR 4/3, 4/4, 5/3, or 5/4.

The Chaix soils in this survey area are a taxadjunct to the Chaix series because the B2 horizon is slightly acid. This difference, however, does not significantly effect use and management.

Competing soils: These are the Dome soils in the same family, and the Chawanakee and Kriest family soils in other families. Dome soils are deep. Chawanakee soils are shallow. Kriest family soils are under the upper montane community of Red Fir Forest.

Geographically associated soils: These are the Holland, Wind River family, and Tollhouse soils, and the competing Chawanakee and Dome soils. The Holland soils are deep and have an argillic horizon. Wind River family soils are deep and have a mollic epipedon. Tollhouse soils are shallow and have a mollic epipedon.

CHAWANAKEE SERIES

The Chawanakee series consists of shallow, somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Montane Chaparral, Yellow Pine Forest, and White Fir-Sugar Pine Forest. The elevation is 3,000 to 8,000 feet. The average annual precipitation is 25 to 50 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are loamy, mixed, mesic, shallow Dystric Xerochrepts.

Typical pedon of Chawanakee series in a unit of Chawanakee-Rock outcrop-Chaix complex, 30 to 50 percent slopes; in Tulare County, California; Sequoia National Forest, Hot Springs Ranger District; on Forest Service road 23S03, about 0.85 miles south of the Parker Pass junction with Forest Service road 23S81 and about 100 feet north of the road at culvert crossing that has large gully; in the NE1/4, SW1/4 of sec. 9, T.23S., R.31E.

A1-0 to 3 inches; grayish brown (10YR 4/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; single grain; loose, very friable, nonsticky and nonplastic; common very fine interstitial pores; 10 percent pebble; slightly acid; clear smooth boundary.

B2-3 to 10 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and coarse roots and common fine roots; many very fine interstitial pores; medium acid; abrupt smooth boundary.

Cr-10 inches; highly weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 8 to 20 inches. The profile is coarse sandy loam and sandy loam. It ranges from 5 to 30 percent gravel. The profile is slightly acid or medium acid.

The A horizon has dry color of 10YR 4/2, 5/2, or 5/3 and moist color of 10YR 3/2 or 3/3. The horizon ranges from 3 to 6 inches in thickness.

The B2 horizon has dry color of 10YR 6/4 or 5/3 and moist color of 10YR 3/3, 4/3, or 4/4.

Competing soils: These are the Chaix, Chawanakee Variant, Cieneba, Dome, and Toem soils in other families. Chaix soils are, moderately deep. Chawanakee Variant soils occur under Mixed Chaparral and Chamise. Cieneba soils do not have a cambic horizon and occur under Foothill Woodland and Mixed Chaparral. Dome soils are deep. Toem soils are sandy and occur under montane community of Montane Chaparral associated with Red Fir Forest and Lodgepole Pine Forest.

Geographically associated soils: These are the Holland, Shaver, Wind River family, and Woolstalf soils, and the competing Chaix and Dome soils. The Holland soils are deep and have an argillic horizon. Shaver soils are deep and have thick umbric epipedon. Wind River family soils are deep and have a mollic epipedon. Woolstalf soils have a thick mollic epipedon, are deep, and are loamy-skeletal.

CHAWANAKEE VARIANT

The Chawanakee Variant consists of shallow, well drained soils on foothills, mountain sides, and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 30 to 75 percent. The main plant community is Mixed Chaparral. The elevation is 2,400 to 5,000 feet. The average annual precipitation is 23 to 35 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are loamy, mixed, thermic, shallow Dystric Xerochrepts.

Typical pedon of Chawanakee Variant in a unit of Kanaka family-Chawanakee Variant-Rock outcrop association, very steep; in Tulare County, Sequoia National Forest, Tule River Ranger District; on trail 30E19 in Stevenson Canyon on the south side of the Middle Fork of the Tule River; in the NE1/4, NE1/4 of sec. 26, T.20S., R.30E.

01-1/3 inch to 0; White-leaf manzanita litter.

A11-0 to 5 inches; yellowish brown (10YR 5/4) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few medium roots; common very fine and fine tubular pores; medium acid; gradual smooth boundary.

A12-5 to 7 inches; light yellowish brown (10YR 6/4) sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine, medium and coarse roots; common very fine and

few fine tubular pores; slightly acid; gradual smooth boundary.

B2-7 to 18 inches; yellowish brown (10YR 5/4) sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine coarse roots; few very fine and fine tubular pores; medium acid; gradual smooth boundary.

Cr-18 inches; brownish yellow (10YR 6/6) weathered granitic material retaining rock structure.

Range in characteristics: Depth to a paralithic contact is 8 to 20 inches.

The A horizon has dry color of 10YR 5/3, 5/4, or 6/4 and moist color of 10YR 3/2, 3/3, or 4/4.

The B horizon has dry color of 10YR or 7.5YR 5/4 or 6/4 and moist color of 10YR or 7.5YR 4/4. The base saturation ranges from 50 to 70 percent.

Competing soils: These are the Chawanakee, Cieneba, Millerton family, and Tollhouse Variant soils in other families. Chawanakee soils occur under the lower montane communities of Montane Chaparral and Yellow Pine Forest.

Geographically associated soils: These are the Auberry, Shaver Variant, and Kanaka family soils, and the competing Cieneba and Tollhouse Variant soils. Auberry soils are deep and have an argillic horizon. Shaver Variant soils are moderately deep and have a mollic epipedon. Kanaka family soils are moderately deep.

CHESAW FAMILY

The Chesaw family consists of moderately deep, excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic and metamorphic rock. Slope ranges from 2 to 50 percent. The main plant communities are Sagebrush Scrub and Fox-tail Limber Pine Forest. The elevation is 7,600 to 9,200 feet. The average annual precipitation is 12 to 20 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are sandy-skeletal, mixed, frigid Entic Haploxerolls.

Typical pedon of Chesaw family in a unit of Chesaw-Nanny families association, steep; in Tulare County, California; Inyo National Forest, Mt. Whitney Ranger District; 0.75 mile north of the intersection of South Fork Kern River jeep trail and Summit Meadow jeep intersection, then 20 feet east of the Summit Meadow trail; in the SW1/4 sec. 17, T.20S., R.36E.

O1-1/2 inch to 0; decomposing sagebrush litter.

A1-0 to 16 inches; brown (10YR 5/3) extremely cobbly loamy coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent pebbles, 60 percent cobbles and 10 percent stones; slightly acid; gradual smooth boundary.

C1-16 to 30 inches; brown (10.5YR 5/3) very stony loamy coarse sand, dark yellowish brown (10.5YR

3/4) moist; single grain; loose; common very fine and fine roots; common very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles, and 15 percent stones; slightly acid; gradual smooth boundary.

C2r-30 inches; strong brown (7.5YR 5/6) weathered granitic material that retains original rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 30 inches. Cobbles, stones, and gravel cover 50 to 60 percent of the soil surface. The profile ranges from 35 to 60 percent gravel, cobbles, and stones.

Competing soils: These are the Glean Variant, Jumpe family, Nanny family, and Sirretta soils in other families. Glean Variant soils are loamy-skeletal and formed in andesite. Jumpe family soils are deep, have an ochric epipedon and a cambic horizon, and are loamy-skeletal. Nanny family soils are deep and have an umbric epipedon and a cambic horizon. Sirretta soils have an ochric epipedon and are not as red as 7.5YR.

Geographically associated soils: These are the Cannell, Cagwin, Cagwin Variant, and Toem soils, and the competing Nanny family soils. Cannell soils are deep and, have an ochric epipedon and a cambic and are coarse-loamy. Cagwin soils have an ochric epipedon and are not skeletal. Cagwin Variant soils are deep, have an ochric epipedon, and are not skeletal. Toem soils are shallow, have an ochric epipedon, and are not skeletal.

CHUALAR FAMILY

The Chualar family consists of moderately deep, well drained soils on mountain sides and ridges. These soils formed in residuum derived from metamorphic, metasedimentary, and basic igneous rocks. Slope ranges from 15 to 75 percent. The main plant communities are Mixed Chaparral, Inland Closed-cone Coniferous Woodland, and Pinyon-Juniper Woodland. The elevation is 1,200 to 6,500 ft. The average annual precipitation is 10 to 30 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are fine-loamy, mixed, thermic Typic Argixerolls.

Typical pedon of Chualar family in a unit of Chualar family-Rock outcrop complex, 50 to 75 percent slopes; Sequoia National Forest, Greenhorn Ranger District, Kern County; in the Piute Mountains, 0.85 miles southeast of the Forest boundary on Forest Service road 27S02; in the SE1/4 sec. 30, T.27S., R.33E.

01-1 inch to 0; cypress litter.

A1-0 to 2 inches; dark brown (10YR 3/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 5 to 20 percent pebbles and cobbles; neutral; clear smooth boundary.

B1t-2 to 9 inches; dark brown (10YR 3/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; fine and very fine roots and few medium roots; many fine tubular pores; few thin clay skins on face of peds; neutral; clear wavy boundary.

B21t-9 to 13 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films lining pores and few thin clay films on faces of peds;

10 percent pebbles and 5 percent cobbles; neutral; gradual wavy boundary.

B22t-13 to 29 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few medium roots; common fine tubular pores; common moderately thick clay films as bridges between mineral grains and lining tubular pores; neutral; gradual wavy boundary.

Cr-29 inches; light yellowish brown weathered basic igneous rock.

Range in characteristics: Depth to a paralithic contact is 20 to 50 inches. The profile ranges from 5 to 20 percent gravel. It is slightly acid or neutral.

The A horizon has dry color of 10YR, 7.5YR 5/3, 5/4, 4/3, or 4/4 and moist color of 10YR, 7.5YR, or 5YR 3/2, 3/3, or 4/4. The horizon is fine sandy loam, sandy loam, loam, or sandy clay loam.

The B2t horizon has dry color of 10YR 5/4, 4/3, 7.5YR 4/4, 5/6, 6/4, or 5YR 4/4 and moist color of 10YR 3/2, 3/3, 4/4, 7.5YR 3/2, or 5YR 3/3. The horizon is clay loam or sandy clay loam.

Competing soils: These are the Bohna soils in the same family, and the Auberry, Brownlee family, Crozier, Hotaw, and Hotaw Variant soils in other families. Bohna soils are deep and formed in granite. Auberry soils have an ochric epipedon and are deep over granite. Brownlee family, Crozier, Hotaw, and Hotaw Variant soils occur under the montane communities of Yellow Pine Forest and Montane Chaparral. Brownlee family soils are deep. Crozier soils have an ochric epipedon. Hotaw soils have an ochric epipedon and formed in granite. Hotaw Variant soils have an ochric epipedon.

Geographically associated soils: These are the Cieneba and Livermore family soils, and the competing Auberry and Bohna soils. Cieneba soils have an ochric epipedon, do not have an argillic horizon, and are shallow. Livermore family soils do not have an argillic horizon and are loamy-skeletal.

CHUMSTICK FAMILY

The Chumstick family consists of shallow, well drained soils on mountain sides and ridges. These soils formed in residuum derived from metamorphic rocks. Slope ranges from 30 to 75 percent. The main plant communities are Montane Chaparral, Lodgepole Pine Forest, and Red Fir Forest. The elevation is 8,000 to 9,300 feet. The average annual precipitation is 35 to 40 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are loamy-skeletal, mixed, frigid Lithic Xerochrepts.

Typical pedon of Chumstick family in a unit of Jumpe-Chumstick families-Rock outcrop complex, 30 to 50 percent slopes; Sequoia National Forest, Tule River Ranger District, Tulare County; in the NE1/4, NE1/4, SW1/4 of sec. 14, T.21S., R.31E.

01-1/3 inch to 0; partially decomposed fir litter.

A1-0 to 2 inches; brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and nonplastic; common medium roots; common very fine interstitial pores; 30 percent pebbles; medium acid; abrupt smooth boundary.

B1-2 to 6 inches; brown (7.5YR 4/4) gravelly loam, dark brown (7.5YR 3/4) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many medium and common very fine roots; common very fine interstitial pores; 30 percent pebbles; medium acid; clear smooth boundary.

B21-6 to 10 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak very fine granular structure; slightly hard, friable, slightly

sticky and slightly plastic; few fine and very fine roots; many medium interstitial pores; 35 percent pebbles; medium acid; clear smooth boundary.

B22-10 to 17 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; few fine roots; many medium interstitial pores; 40 percent pebbles; medium acid; abrupt wavy boundary.

R-17 inches; weathered, hard metamorphic bedrock.

Range in characteristics: Depth to a lithic contact is 10 to 20 inches. The profile ranges from 35 to 65 percent gravel and cobbles. It is medium acid or slightly acid. The profile is loam or clay loam and is 18 to 35 percent clay. The profile has hues of 10YR or 7.5YR.

Competing soils: These are the Chesaw family, Nanny family, Sirretta, and loem soils in other families. Nanny family soils are deep, have an umbric epipedon, and formed in granite. Chesaw family soils have a mollic epipedon, are moderately deep, and are sandy-skeletal. Sirretta soils are moderately deep, do not have a cambic horizon, and are sandy-skeletal. Toem soils are sandy, do not have a cambic horizon, and are sandy-skeletal. Toem soils are sandy, do not have a cambic horizon, and formed in granite.

Geographically associated soils: These are the Baldmountain, Cannell, Cagwin, and Jumpe family soils, and the competing Nanny family soils. Baldmountain soils are deep, have a mollic epipedon, and are coarse-loamy. Cannell soils are deep, coarse-loamy and formed in granite. Cagwin soils are moderately deep, do not have a cambic horizon, and are sandy. Jumpe family soils are deep.

CIENEBA SERIES

The Cieneba series consists of shallow, somewhat excessively drained soils on foothills, mountain sides, and ridges. These soils formed in residuum derived from granite rock. Slope ranges from 5 to 75 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is mainly 1,000 to 6,600 feet. The average annual precipitation is mainly 18 to 29 inches. The soil may range to lower elevations and precipitations. The average annual growing season is 180 to 300 days.

Taxonomic class: These soils are loamy, mixed, nonacid, thermic, shallow Typic Xerorthents.

Typical pedon of Cieneba series in a unit of Rock outcrop-Cieneba complex, 50 to 75 percent slopes; Kern County, California; Sequoia National Forest, Cannell Meadow Ranger District; from the junction of Kernville road and Sierra Way in Kernville; 0.9 miles south on Sierra Way and 1/2 way up west-facing mountain slope; in the NW1/4 Sec. 23, T.25S., R.33E.

A1-0 to 12 inches; pale brown (10YR 6/3) coarse sandy loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; soft very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; slightly acid; abrupt smooth boundary.

Cr-12 inches; highly weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 40 to 20 inches. The profile ranges from 5 to 20 percent gravel. It is slightly acid or neutral. The profile is coarse sandy loam or sandy loam.

The A horizon has dry color of 10YR 6/3, 6/2, 5/3, or 5/2 and moist color of 10YR 5/3, 5/2, 4/3, 4/2, 3/3, or 3/2.

Competing soils: These are the Chawanakee Variant, Millerton family, Tollhouse Variant, and Kanaka family soils in other families. Millerton family soils have a lithic contact and an argillic horizon. Chawanakee Variant soils have a cambic horizon. Tollhouse Variant soils have a mollic epipedon. Kanaka family soils are moderately deep and have a cambic horizon.

Geographically associated soils: These are the Auberry, Bohna, and Chualar family soils, and the competing Chawanakee Variant soils. Auberry soils are deep and have an argillic horizon. Bohna soils are deep, have a mollic epipedon, and an argillic horizon. Chualar family soils are moderately deep, and have a mollic epipedon and an argillic horizon.

CROZIER SERIES

The Crozier series consists of moderately deep, well drained soils on mountain sides. These soils formed in residuum derived dominantly from basalt. Slope ranges from 5 to 40 percent. The main plant communities are Yellow Pine Forest, White Fir-Sugar Pine Forest, Montane Chaparral, and Mixed Conifer. The elevation is 4,800 to 6,600 feet. The average annual precipitation is 20 to 39 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical pedon of Crozier series in a unit of Boomer-Crozier-Rock outcrop complex, 5 to 40 percent slopes; Sequoia National Forest, Tulare County, Tule River Ranger District; about 0.5 miles west of Fish Creek on the south side of trail 32E16; in the NW1/4, SW1/4, NE1/4 sec. 11, T.20S., R.32E.

01-3 to 2 inches; undecomposed pine litter.

02-2 inches to 0; partially decomposed pine litter.

A11-0 to 3 inches; brown (7.5YR 5/3) cobbly loam, dark brown (7.5YR 3/4) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 5 percent pebbles and 10 percent cobbles; neutral; abrupt smooth boundary.

A12-3 to 8 inches; dark brown (7.5YR 4/4) loam, dark brown (7.5YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; 5 percent pebbles; neutral; gradual smooth boundary.

B1-8 to 20 inches; brown (7.5YR 5/3) cobbly loam, dark reddish brown (5YR 3/3) moist; moderate medium and fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; 5 percent pebbles and 10 percent cobbles; neutral; gradual smooth boundary.

B2t-20 to 32 inches; brown (7.5YR 5/4) cobbly clay loam, dark brown (7.5YR 3/4) moist; moderate medium and fine subangular blocky structure; hard, firm, sticky and plastic; few very fine, fine and medium roots; few very fine and fine tubular pores; common thin clay films on faces of peds; 20 percent weathered basalt cobbles; slightly acid; clear wavy boundary.

R-32 inches; weathered basalt.

Range in characteristics: Depth to a lithic contact is 29 to 39 inches. The profile ranges from 5 to 35 percent gravel and cobbles. It is slightly acid or neutral.

Competing soils: These are the Boomer, Holland, Hotaw, and Hotaw Variant soils in the same family, and the Brownlee family soils in another family. Boomer soils are deep and are redder than 5YR. Holland soils are deep and have paralithic contact with granitic rock. Hotaw soils do not have hues of 5YR and have a paralithic contact with granitic rock. Hotaw Variant soils are 70 to 29 inches deep over metasedimentary rock. Brownlee family soils are deep, have a mollic epipedon, and have a paralithic contact with metamorphic rock.

Geographically associated soils: These are the Chaix, Chawanakee, and Dome soils, and the competing Boomer soils. Chaix, Chawanakee, and Dome soils do not have an argillic horizon and are coarse-loamy. Dome soils are deep, and Chawanakee soils are shallow.

DOME SERIES

The Dome series consists of deep, well drained soils on mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Yellow Pine Forest, Mixed Conifer Forest, White Fir-Sugar Pine Forest, and Montane Chaparral. The elevation is 5,000 to 7,400 feet. The average annual precipitation is 25 to 51 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Dystric Xerochrepts.

Typical pedon of Dome series in a unit of Dome-Chaix outcrop association, moderately steep; in Tulare County, California; Sequoia National Forest, Cannell Meadow Ranger District; on Bartolas Road, approximately 0.1 miles south of intersection of Forest Service Road 24S13, and 50 feet west of Bartolas Road; in the NE1/4 of sec. 35, T24S., R.34E.

01–2 inches to 0; forest duff of dead and decomposing pine needles, twigs, and bark.

A1–0 to 7 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse and medium subangular blocky structure parting to moderate fine and medium granular; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; few very fine and fine tubular pores and common very fine and fine interstitial pores; 14 percent pebbles; medium acid; clear smooth boundary.

B2–7 to 28 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; many medium and coarse roots; common very fine tubular pores; 10 percent pebbles; medium acid; gradual smooth boundary.

C1–28 to 50 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; mas-

sive; slightly hard, friable, nonsticky and nonplastic; many medium and coarse roots; few very fine and fine tubular pores; 10 percent pebbles; medium acid; clear smooth boundary.

C2–50 inches; highly weathered granitic rock that has retained original rock structure.

Range in characteristics: Depth to a paralithic contact is 39 to 59 inches. The profile ranges from 5 to 20 percent as gravel. It is coarse sandy loam or sandy loam.

The A horizon has dry color of 10YR 4/2, 4/3, 5/2, or 5/3 and moist color 10YR 3/2, 3/3, 4/2, or 4/3. Mollic colors do not extend below a depth of 9 inches. The horizon is slightly acid or medium acid. It ranges from 6 to 9 inches in thickness.

The B horizon has dry color of 10YR 5/3, 5/4, 6/3, or 6/4 and moist color of 10YR 3/3, 3/4, 4/3, 4/4, 5/3, or 5/4. Base saturation is 55 percent. The horizon is medium acid or strongly acid.

The C horizon has dry color of 10YR 6/3, 6/4, or 7/3 and moist color of 10YR 4/3, 4/4, or 5/4. The horizon is medium acid or strongly acid.

Competing soils: These are the Chaix soils in the same family, and the Cannell, Chawanakee, Shaver, and Wind River family soils in other families. Chaix soils are moderately deep. Cannell soils occur in the upper montane under Red Fir Forest. Chawanakee soils are shallow. Shaver soils have a thick unbric epipedon. Wind River family soils have a mollic epipedon.

Geographically associated soils: These are the Holland, Junipero family, and Woolstalf soils, and the competing Chaix and Chawanakee soils. Holland soils have an argillic horizon and are fine-loamy. Junipero family soils have a thick mollic epipedon. Woolstalf soils have a thick mollic epipedon and are loamy-skeletal.

GLEAN VARIANT

The Glean Variant consists of moderately deep, somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from andesite. Slope ranges from 20 to 60 percent. The main plant communities are Yellow Pine Forest, Lodgepole Pine Forest, and Sagebrush Scrub. The elevation is 7,600 to 9,900 feet. The average annual precipitation is 20 to 29 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are loamy-skeletal, mixed, frigid Entic Ultic Haploxerolls.

Typical pedon of Glean Variant in a unit of Glean Variant extremely gravelly fine sandy loam, 20 to 60 percent slopes; in Inyo National Forest, Tulare County, Mt. Whitney Ranger District. On the east slope of Monache Mountain, about 1,000 feet south of trail 25E28 and 35E15 intersection, and about 1,500 feet west of trail 25E28; in the NE1/4, NE1/4 of sec. 9, T.20S., R.35E.

01–2 inches to 0; dead and decomposing pine needles.

A1–0 to 12 inches; brown (10YR 5/3) extremely gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist, weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; many fine and medium tubular pores; 60 percent pebbles and cobbles; neutral; clear wavy boundary.

C1–12 to 30 inches; light brownish gray (10YR 6/2) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure and single grain; soft, very friable, nonsticky and nonplastic; common medium and coarse roots; common fine tubular pores; 75 percent pebbles and cobbles; neutral; clear wavy boundary.

C2–30 to 36 inches; pale brown (10YR 6/3) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; single grain; loose; few coarse roots; 80 percent pebbles and cobbles; neutral; gradual wavy boundary.

R–26 inches; highly fractured andesite rock.

Range in characteristics: Depth to a lithic contact is 20 to 39 inches. The profile is fine sandy loam, sandy loam, or coarse sandy loam. It ranges from 50 to 80 percent as gravel and cobbles. The profile is slightly acid or neutral.

The A horizon has dry color of 10YR 5/2 or 5/3.

The C horizon has dry color of 10YR 6/2 or 6/3 and moist color of 10YR 4/3 or 4/4.

Competing soils: These are the Typic Haploxerolls, Jumpe family, Nanny family, Chesaw family, and Sirretta soils in other families. Typic Haploxerolls have a cambic horizon, are moderately well drained, and formed in alluvium. Jumpe family soils have an umbric epipedon and a cambic horizon. Chesaw family soils are sandy-skeletal. Sirretta soils have an ochric epipedon, a cambic horizon, and are moderately deep.

Geographically associated soils: These are the Cagwin, Cannell, and Toem soils, and the competing Nanny family and Sirretta soils. Cagwin soils are moderately deep, sandy, and have an ochric epipedon. Cannell soils have an ochric epipedon, a cambic horizon, and are coarse-loamy. Toem soils are shallow sandy soils that have an ochric epipedon.

HOLLAND SERIES

The Holland consists of deep, well drained soils on foothills, mountain sides, and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 3,020 to 7,380 feet. The average annual precipitation is 20 to 51 inches and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical pedon of Holland in a unit of Holland-Hotaw association, moderately steep; in Fresno County, California, Sequoia National Forest, Hume Lake Ranger District. On north side of Forest Service road 13S42, approximately 1 mile west of junction of 13S42 and 13S01; in the SW1/4, SW1/4 of sec. 15, T.13S., R.28E.

01-1 inch to 0; dead and decomposing pine and cedar needles, twigs, and bark.

A1-0 to 5 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; slightly acid; clear smooth boundary.

B1-5 to 9 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; very few thin clay films as bridges between mineral grains; medium acid; gradual smooth boundary.

B21t-9 to 18 inches; pale brown (10YR 6/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; few thin clay films as bridges between mineral grains; medium acid; gradual smooth boundary.

B22t-18 to 25 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few medium roots; few very fine tubular pores; few thin clay films as bridges between mineral grains; medium acid; gradual smooth boundary.

B23t-25 to 46 inches; yellowish brown (10YR 5/4) sandy

clay loam, brown (7.5YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few medium roots; few very fine tubular pores; common thin clay films on faces of peds and as bridges between mineral grains; medium acid; gradual smooth boundary.

B3t-46 to 59 inches; light yellowish brown (10YR 6/4) sandy clay loam; yellowish brown (10YR 5/4) moist; weak medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few medium roots; few very fine tubular pores; common thin clay films as bridges between mineral grains; medium acid.

Range in characteristics: Depth to a paralithic contact is 59 to 78 inches. The profile is slightly acid in the surface layer and strongly acid in the subsoil.

The A horizon has dry color of 10YR 4/2, 5/2, 5/3, or 7.5YR 5/4 and moist color of 10YR 4/3, 3/3, or 3/2. The horizon is sandy loam or loam. It ranges from 5 to 8 inches in thickness.

The B2t horizon has dominant dry color of 7.5YR 5/6 or 6/6 or 5YR 5/6 and moist color of 7.5YR 4/4 or 5/6 or 5YR 4/6 or 4/8. The horizon is sandy clay loam or clay loam or clay loam. In some areas the dry color ranges to 10YR 6/3, 6/4, or 5/4 and the moist color ranges to 10YR 4/3, 4/4, 5/4, or 5/6.

Some of the Holland soils in this survey area are taxadjunct to the Holland series because they have a hue of 10YR. This difference, however, does not significantly effect use and management.

Competing soils: These are the Boomer, Crozier, Hotaw, and Hotaw Variant soils in the same family, and the Auberry and Brownlee family soils in other families. Boomer soils do not have a hue of 7.5YR or 5YR and they formed in basalt. Crozier soils are moderately deep, have a lithic contact, and formed in basalt. Hotaw soils are moderately deep and do not have a hue of 5YR. Hotaw Variant soils are moderately deep over metasedimentary rock. Auberry occur at lower elevations under communities of Foothill Woodland, Mixed Chaparral, or Chamisal. Brownlee family soils have a mollic epipedon and formed in metamorphic rock.

Geographically associated soils: These are the Bohna, Chaix, Chawanakee, Dome, and Shaver soils, and the competing Auberry and Hotaw soils. Bohna soils have a mollic epipedon and occur under communities of Foothill Woodland or Mixed Chaparral. Chaix

soils are moderately deep, do not have an argillic horizon, and are coarse-loamy. Chawanakee soils are shallow, do not have an argillic horizon, and are coarse-loamy. Dome soils do not have an argillic horizon and

are coarse-loamy. Shaver soils have a thick unbric epipedon, do not have an argillic horizon, and are coarse-loamy.

HOTAW SERIES

The Hotaw series consists of moderately deep, well drained soils on foothills, mountain sides, and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 50 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 3,200 to 7,600 feet. The average annual precipitation is 29 to 51 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical pedon of Hotaw series in a unit of Holland-Hotaw association, moderately steep; in Sequoia National Forest, Fresno County, Hume Lake Ranger District; on the north side of Forest Service road 13S42, approximately 1.2 miles west of its junction with road 13S01; in the SE1/4, SE1/4 of sec. 16, T.13S., R.28E.

A1-0 to 6 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure and moderate medium and fine granular; slightly hard, very friable, nonsticky and slightly plastic; common fine and very fine roots; common very fine and fine interstitial pores; slightly acid; clear smooth boundary.

B1t-6 to 14 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; few fine and very fine tubular pores; few thin clay films as bridges between mineral grains; medium acid; gradual wavy boundary.

B2t-14 to 32 inches; strong brown (7.5YR 5/6) clay loam, dark brown (7.5YR 4/4) moist; moderate medium and fine subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots and common medium and coarse roots; common

fine and very fine tubular pores; common moderately thick clay films on faces of peds; medium acid; clear wavy boundary.

Cr-32 inches; highly weathered granitic rock material retaining original rock structure; massive; common moderately thick clay films as bridges between mineral grains.

Range in characteristics: Depth to a paralithic contact is 21 to 39 inches.

The A horizon has dry color of 10YR 5/3 or 7.5YR and moist color of 10YR 3/2 or 7.5YR 4/4 or 3/2. The horizon is sandy loam, loam, or clay loam. It is slightly acid or neutral. The A horizon ranges from 5 to 9 inches in thickness.

The B2t horizon has dry color of 7.5YR 4/4 or 5/6 or 10YR 4/3 and moist color of 7.5YR 4/4 or 3/4 or 10YR 4/2.

Competing soils: These are the Boomer, Crozier, Holland, and Hotaw Variant soils in the same family, and the Auberry and Brownlee family soils in other families. Boomer soils are deep and have a hue redder than 7.5YR. Crozier soils have a lithic contact and formed in basalt. Holland soils are deep. Hotaw Variant soils have a lithic contact and formed in metasedimentary rock. Auberry soils are deep and occur under communities of Foothill Woodland, Mixed Chaparral, or Chamisal. Brownlee family soils are deep and have a mollic epipedon.

Geographically associated soils: These are the Chaix, Chawanakee, Dome, and Shaver soils, and the competing Holland soils. Chaix soils do not have an argillic and are coarse-loamy. Chawanakee soils are shallow, do not have an argillic horizon, and are coarse-loamy. Dome soils are deep, do not have an argillic horizon, and are coarse-loamy. Shaver soils are deep, have a thick umbric epipedon, do not have an argillic horizon, and are coarse loamy.

HOTAW VARIANT

The Hotaw Variant consists of moderately deep, well drained soils on mountain sides and ridges. These soils formed in residuum derived from metamorphic and metasedimentary rock. Slope ranges from 30 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 3,900 to 7,200 feet. The average annual precipitation is 29 to 39 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical pedon of Hotaw Variant in a unit of Hotaw Variant-Brownlee family-Rock outcrop complex, 40 to 75 percent slopes; in Tulare County, California, Sequoia National Forest, Hume Lake Ranger District; on north side of Forest Service Road 14S35 approximately 1.1 miles east of the junction with road 14S43; in the center of the NE1/4, SE1/4 of sec. 13, T.14S., R.28E.

A1-0 to 5 inches; dark brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, medium, and coarse roots; common fine and very fine tubular pores; 10 percent pebbles; slightly acid; clear smooth boundary.

B21-5 to 16 inches; dark brown (7.5YR 4/4) gravelly loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic;

common fine and very fine tubular pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B22t-16 to 28 inches; dark brown (10YR 4/3) gravelly clay loam, dark grayish brown (10YR 4/2) moist; strong medium and fine subangular blocky structure; hard, friable, sticky and plastic; common fine, medium, and coarse roots; common fine, and coarse tubular pores; few thin clay films as bridges between mineral grains and on faces of peds; 20 percent pebbles; slightly acid; abrupt irregular boundary.

R-28 inches; vertically tilted and highly fractured metasedimentary rock.

Range in characteristics: Depth to a lithic contact is 20 to 29 inches.

Competing soils: These are the Boomer, Crozier, Holland, and Hotaw soils in the same family, and the Brownlee family soils in another family. Boomer soils are deep and have a hue redder than 7.5YR. Crozier soils have a hue redder than 7.5YR and formed in basalt. Holland soils are deep and formed in granite. Hotaw soils are formed in granite and typically are more than 30 inches deep. Brownlee family soils are deep and have a mollic epipedon.

Geographically associated soils: These are the Chualar family and Shaver soils, and the competing Brownlee family and Holland soils. Chualar family soils have a mollic epipedon and occur under a community of Mixed Chaparral. Shaver soils have a thick umbric epipedon and do not have an argillic horizon.

JUMPE FAMILY

The Jumpe family consists of deep, well drained soils on mountain sides. These soils formed in residuum derived from metasedimentary rock. Slope ranges from 30 to 75 percent. The main plant communities are Red Fir Forest, Lodgepole Pine Forest, and White Fir Forest. The elevation is 7,200 to 9,300 feet. The average annual precipitation is 20 to 39 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are loamy-skeletal, mixed, frigid Dystric Xerochrepts.

Typical pedon of Jumpe family in a unit of Baldmountain-Rock outcrop-Jump family complex, 5 to 30 percent slopes; in Sequoia National Forest, Tulare County, Cannell Meadow Ranger District; on the east side of Forest Service road 22S01 at the junction with Forest Service road 12S10; in the SW1/4, NE1/4 of sec. 24, T.23S., R.33E.

A1-0 to 8 inches; brown (7.5YR 4/4) sandy loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; many fine tubular pores; neutral; clear smooth boundary.

B2-8 to 23 inches; brown (7.5YR 4/4) gravelly fine sandy loam, reddish brown (5YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; many fine tubular pores; 30 percent pebbles and 15 percent cobbles; neutral; clear smooth boundary.

C1-23 to 47 inches; reddish yellow (7.5YR 7/6) very gravelly loam, strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common medium roots; common fine tubular pores; 50 percent pebbles; few thin clay films lining tubular pores; slightly acid; clear smooth boundary.

C2-47 to 51 inches; reddish yellow (7.5YR 6/6) extremely gravelly and cobbly fine sandy loam, strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure grading to massive; slightly hard, friable, slightly sticky and slightly plastic; few coarse roots; common fine tubular pores; 65 percent pebbles and 25 percent cobbles; slightly acid.

Range in characteristics: The solum ranges from 8 to 23 inches in thickness. Depth to rock ranges from 51 to 78 inches. The profile ranges from 35 to 90 percent gravel and cobbles. It is neutral or slightly acid.

The A horizon has dry color of 10YR 5/3 or 5/4 or 7.5YR 4/4, and moist color of 10YR 3/3 or 4/3, 5YR 3/3, or 7.5YR 3/2.

The B horizon has dry color of 10YR 6/4 or 7.5YR 4/4 OR 5/4 and moist color of 10YR 4/4, 5YR, 4/3, or 7.5YR 3/4.

Competing soils: These are the Glean Variant, Nanny family, Chesaw family, and Sirretta soils in other families. Glean Variant soils are moderately deep, have a mollic epipedon, and do not have a cambic horizon. Nanny family soils are only as red as 7.5YR and have an umbric epipedon. Chesaw family soils are moderately deep, have a mollic epipedon, do not have a cambic horizon, and are sandy-skeletal. Sirretta soils are moderately deep, do not have a cambic horizon, and are sandy-skeletal.

Geographically associated soils: These are the Baldmountain, Cagwin, Cannell, and Chumstick family soils, and the competing Nanny family soils. Baldmountain soils have a mollic epipedon and are coarse-loamy. Cagwin soils are moderately deep, sandy, and do not have a cambic horizon. Cannell soils are coarse-loamy and formed in granite. Chumstick family soils are shallow.

JUNIPERO FAMILY

The Junipero family consists of deep, moderately well drained soils in upland basins. These soils formed in alluvium derived from granitic and metamorphic rock. Slope ranges from 0 to 15 percent. The main plant community is Montane Meadow. The elevation is 4,700 to 7,600 feet. The average annual precipitation is 20 to 40 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Pachic Ultic Haploxerolls.

Typical pedon of Junipero family in a unit of Monache Variant, drained, warm-Junipero family association, gently sloping; in Tulare County, California, Sequoia National Forest, Cannell Meadow Ranger District; at the south end of True Meadow; in NW1/4, NW1/4 of sec. 34, T.24S., R.34E.

A1-0 to 12 inches; grayish brown (10YR 5/2) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure parting to strong very fine and fine granular; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common fine tubular pores; many very fine and fine interstitial pores; slightly acid; gradual smooth boundary.

B2-12 to 30 inches; grayish brown (10YR 5/2) sandy loam, very dark gray (10YR 3/1) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; very few fine and fine roots; common very fine and fine tubular pores; slightly acid; clear smooth boundary.

C1-30 to 48 inches; light brownish gray (10 YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; few fine faint mottles that are dark brown (10YR 4/3) when moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, non-sticky and slightly plastic; very few fine and fine roots; few very fine tubular pores; neutral; gradual smooth boundary.

C2-48 to 59 inches; light brownish gray (10YR 6/2) loamy sand, grayish brown (10YR 5/2) moist; few

fine and medium distinct mottles that are yellowish brown (10YR 5/6) when moist; weak medium and coarse subangular blocky structure; soft very friable, nonsticky and nonplastic; very few very fine and fine roots; few very fine tubular pores; neutral.

Range in characteristics: The solum ranges from 20 to 29 inches in thickness. The profile is mainly loam and sandy loam, but in some pedons the substratum is coarser textured. The profile is neutral or slightly acid.

The A horizon has dry color of 10YR 5/2 or 4/2 and moist color of 10YR 3/1 or 3/2.

The B2 horizon has colors similar to those of the horizon.

The C horizon has dry color of 10YR 6/2 or 6/3 and moist color of 10YR 5/2 or 5/3. The mottles have moist color of 10YR 4/3, 5/3, 5/4, 5/6, or 5/8.

Competing soils: These are the Typic Haploxerolls, Monache, the Monache Variant, drained, warm, and the Shaver and Shaver Variant soils in other families. Typic Haploxerolls have a mollic epipedon that is not thick, and they are in an upper montane community of Montane Meadow. Monache soils have an irregular decrease in organic matter as depth increases, and are in the upper montane communities of Montane Meadow and Lodgepole Pine Forest. Monache Variant, drained, warm soils are somewhat poorly drained and have an irregular decrease in organic matter as depth increases. Shaver soils are well drained, have thick umbric epipedon, and a paralithic contact. Shaver Variant soils are well drained, moderately deep, have a paralithic contact, and occur under Foothill Woodland and Mixed Chaparral communities.

Geographically associated soils: These are the Chaix, Chawanakee, Dome, and Holland soils, and the competing Monache Variant, drained, warm soils. Chaix soils have an ochric epipedon and are moderately deep. Chawanakee soils are shallow and have an ochric epipedon. Dome soils have an ochric epipedon and are well drained. Holland soils are well drained, have an ochric epipedon and an argillic horizon, and are fine-loamy.

KANAKA FAMILY

The Kanaka family consists of moderately deep, well drained soils on foothills and mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 30 to 75 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 1,600 to 5,000 feet. The average annual precipitation is 23 to 29 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are coarse-loamy, mixed, thermic Dystric Xerochrepts.

Typical pedon of Kanaka family in a unit of Kanaka-Millerton families-Rock outcrop association, steep; in Sequoia National Forest, Tule River Ranger District, Tulare County; at the Forest entry sign on Highway 190, about 220 feet north of the highway; in NE1/4, NW1/4 of sec. 6, T.21S., R.30E.

A11-0 to 2 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine and fine interstitial pores; 30 percent pebbles; slightly acid; clear smooth boundary.

A12-2 to 9 inches; brown (10YR 5/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores and common very fine tubular pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B2-9 to 18 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores and common very fine tubular pores; very few

thin clay films lining tubular pores; 15 percent pebbles; slightly acid; clear smooth boundary.

C1-18 to 26 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine tubular and interstitial pores; few moderately thick clay films lining tubular pores and bridging mineral grains around pebbles; 15 percent pebbles; slightly acid; clear smooth boundary.

C2r-26 inches; light yellowish brown (10YR 6/4) highly weathered granitic rock, dark yellowish brown (10YR 4/4) moist; relic rock structure; many moderately thick clay films lining pores and bringing mineral grains.

Range in characteristics: Depth to a paralithic contact is 20 to 39 inches. The profile ranges from 5 to 30 percent gravel. It is sandy loam or coarse sandy loam. The profile is slightly acid or neutral.

The A horizon has dry color of 10YR 5/3, 6/3, or 6/4 and moist color of 10YR or 7.5YR 4/2, 4/3, 3/2, or 3/3.

The B2 horizon has dry color of 10YR 5/4 or 6/4 and moist color of 10YR 3/4 or 4/3, 4/4 or 7.5YR 4/4.

Competing soils: These are the Cieneba and Shaver Variant soils in other families. Cieneba soils do not have a cambic horizon and are shallow. Shaver Variant soils have a thick mollic epipedon.

Geographically associated soils: These are the Auberry, Chawanakee Variant, and Millerton family soils. Auberry soils are deep and have a fine-loamy atgillic horizon. Chawanakee Variant soils are shallow. Millerton family soils are shallow with a lithic contact and do not have a cambic horizon.

KRIEST FAMILY

The Kriest family, consists of moderately deep, well drained soils on mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Red Fir Forest, White Fir Forest, and Montane Chaparral. The elevation is 6,560 to 9,000 feet. The average annual precipitation is 29 to 51 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: coarse-loamy, mixed, frigid Dystric Xerochrepts

Typical pedon of Kriest family, in a unit of Cannell-Kriest family-Rock outcrop complex, 5 to 30 percent slopes; in Fresno County, California, Sequoia National Forest, Hume Lake Ranger District; on Forest Service road 13S04, approximately 1.4 miles south of intersection of Forest Service roads 13S04 and 14S02 toward Buck Rock Lookout; in the SE1/4 of sec. 31, T.13S., R.29E.

01-2 inches to 0; partially decomposed forest litter.

A1-0 to 5 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; common fine interstitial pores; slightly acid; clear smooth boundary.

B1-5 to 14 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; moderate fine granular structure and weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; many medium and coarse roots; common fine interstitial

pores; 10 percent pebbles; neutral; gradual smooth boundary.

B2-14 to 32 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and coarse roots; common fine interstitial pores; 10 percent pebbles; slightly acid; abrupt wavy boundary.

Cr-32 inches; weathered granitic rock retaining original rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 40 inches. The profile is slightly acid or neutral and is sandy loam or coarse sandy loam. It ranges from 5 to 20 percent gravel.

The A horizon has dry color of 10YR 4/2, 4/3, or 5/2 and moist color of 10YR 3/2, 3/3, or 3/4. The A horizon ranges from 5 to 8 inches in thickness.

The B horizon has dry color of 10YR 5/3, 5/4, 6/3, or 6/4 and moist color of 10YR 4/3, 4/4, 5/3, or 5/4.

Competing soils: These are the Cannell soils in the same family, and the Cagwin and Chaix soils in other families. Cannell soils are deep. Cagwin soils are sandy and do not have a cambic horizon. Chaix soils occur the lower montane community of Yellow Pine Forest.

Geographically associated soils: These are the Nanny family and Toem soils and the competing Cagwin and Cannell soils. Nanny family soils are deep, have an umbric epipedon, and are skeletal. Toem soils are shallow, sandy, and do not have a cambic horizon.

LIVERMORE FAMILY

The Livermore family consists of moderately deep, well drained soils on foothills and mountain sides. These soils formed in residuum derived from metasedimentary rock. Slope ranges from 30 to 75 percent. The main plant communities are foothill Woodland and Mixed Chaparral. The elevation is 3,500 to 7,000 feet. The average annual precipitation is 8 to 30 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are loamy-skeletal, mixed, thermic Typic Haploxerolls.

Typical pedon of Livermore family in a unit of Livermore family-Rock outcrop complex, 30 to 50 percent slopes; in Sequoia National Forest, Greenhorn Ranger District, Kern County; above large cutbank on Highway 155, about 0.4 miles east of Cedar Creek campground; in the NE1/4, NW1/4 of sec. 19, T.25S., R.32E.

01-1 inch to 0; litter from oaks and shrubs.

A11-0 to 5 inches; dark brown (10YR 3/3) stony sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and few fine tubular pores; 15 percent pebbles and 5 percent stones; slightly acid; gradual wavy boundary.

A12-5 to 18 inches; dark brown (10YR 3/3) cobbly sandy loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; 15 percent pebbles and 15 percent cobbles; slightly acid; gradual wavy boundary.

B2-18 to 25 inches; strong brown (7.5YR 5/6) very gravelly sandy loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly

hard, friable, slightly sticky and slightly plastic; common fine roots; many very fine tubular fine interstitial pores; 45 percent pebbles and 20 percent cobbles; slightly acid; clear smooth boundary.

C1-25 to 29 inches; brown (7.5YR 5/4) very gravelly sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure and massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 65 percent pebbles and 25 percent cobbles; slightly acid; gradual wavy boundary.

C2r-29 inches; weathered metasedimentary rock.

Range in characteristics: Depth to a paralithic or lithic contact is 20 to 39 inches. The profile ranges from 35 to 90 percent gravel and cobbles. It is slightly acid or neutral.

The A horizon has dry color of 10YR 3/3 or 5/4 and moist color of 10YR 2/2 or 3/2.

The B horizon has dry color of 10YR 5/4 or 7.5YR 5/6 and moist color of 10YR 4/3 or 7.5YR 4/4.

Competing soils: These are the Shaver Variant and Tollhouse Variant soils in other families. Shaver Variant soils have a thick mollic epipedon and are coarse-loamy. Tollhouse Variant soils do not have a cambic horizon and are loamy and shallow.

Geographically associated soils: These are the Auberry, Bohna, Chualar family, and Cieneba soils. Auberry soils are deep and have an ochric epipedon and an argillic horizon. Bohna soils are deep and have an argillic horizon. Chualar family soils have an argillic horizon and are not skeletal. Cieneba soils have an ochric epipedon, are shallow, and are not skeletal.

MILLERTON FAMILY

The Millerton family consists of shallow, well drained soils on foothills and mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 30 to 50 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 1,600 to 4,000 feet. The average annual precipitation is 16 to 35 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are loamy, mixed, thermic Lithic Haploxeralfs.

Typical pedon of Millerton family in a unit of Kanaka-Millerton families-Rock outcrop association, steep; in Sequoia National Forest, Tule River Ranger District, Tulare County; about 300 feet north of large turnout on Highway 190 just west, and overlooking, Coffee Camp Picnic area (and 30 to 45 feet north of range enclosure fence); in the SE1/4, SW1/4 of sec. 29, T.20S., R.30E.

01-1 inch to 0; annual grass litter.

A11-0 to 1 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 15 percent pebbles; neutral; abrupt smooth boundary.

A12-1 to 6 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots;

common very fine tubular pores; 15 percent pebbles; slightly acid; clear smooth boundary.

B1-6 to 11 inches; brown (7.5YR 5/4) gravelly sandy loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine tubular pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B2t-11 to 14 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine tubular pores; few thin clay films in pores and bridging sand grains; slightly acid; abrupt smooth boundary.

R-14 inches; hard granitic rock; thin, discontinuous, brown clay films coating upper surface of the rock.

Range in characteristics: Depth to a lithic contact is 8 to 20 inches.

Competing soils: These are the Chawanakee Variant, Cieneba, and Tollhouse Variant soils in other families. Chawanakee Variant soils have a cambic horizon and a paralithic contact. Cieneba soils have a paralithic contact. Tollhouse Variant soils have a mollic epipedon and a paralithic contact.

Geographically associated soils: These are the Auberry and Kanaka family soils, and the competing Cieneba soils. Auberry soils are deep and have a paralithic contact. Kanaka family soils are moderately deep and have a cambic horizon and a paralithic contact.

MONACHE SERIES

The Monache series consists of deep, moderately well drained soils on the edges of upland basin. These soils formed in alluvium derived dominantly from granitic rock. Slope ranges from 0 to 15 percent. The main plant communities are Sagebrush Scrub and Lodgepole Pine Forest. The elevation is 6,000 to 9,000 feet. The average annual precipitation is 14 to 50 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are coarse-loamy, mixed, frigid Cumulic Ultic Haploxerolls.

Typical pedon of Monache series in a unit of Monache Variant, drained-Monache association, gently sloping; in Tulare County, California, Sequoia National Forest, Cannell Meadow Ranger District; approximately 0.2 miles northeast of Troy Meadow campground, where Fish Creek dissects Troy Meadows; in the SW1/4, NE1/4 of sec. 30, T.21S., R.35E

A11-0 to 13 inches; grayish brown (10YR 4/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure and moderate fine and very fine granular structure; soft, very friable, nonsticky and slightly plastic; many medium, fine and very fine roots; few fine and very fine tubular pores and common fine and very fine interstitial pores; slightly acid; gradual smooth boundary.

A12-13 to 23 inches; grayish brown (10YR 5/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium, fine and very fine roots; very few very fine tubular pores; slightly acid; gradual smooth boundary.

C1-23 to 35 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; few fine faint dark brown (10YR 4/3) mottles; weak coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, fine, and very fine roots; very few very fine tubular pores; 5

percent pebbles; slightly acid; clear smooth boundary.

C2-35 to 59 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; common fine faint dark brown (10YR 4/3) mottles; weak coarse, medium, and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very few fine and very fine roots; very few very fine tubular pores; 20 percent pebbles; neutral.

Range in characteristics: The solum ranges from 20 to 23 inches in thickness. The profile is slightly acid or neutral. Faint mottles occur below a depth of 20 inches.

The A horizon has dry color of 10YR 4/2, 4/3, 5/2, or 5/3 and moist color of 10YR 3/2 or 3/3. The horizon is fine sandy loam, very fine sandy loam, or loam. It ranges from 20 to 30 inches in thickness.

The C horizon has dry color of 10YR 4/2, 4/3, 5/3, 6/2, or 6/3 and moist color of 10YR 3/2, 3/3, 4/2, 4/3, or 4/4. The horizon is loam or sandy loam. It ranges from 0 to 30 percent gravel.

Competing soils: These are the Monache Variant soils, drained, Typic Haploxerolls, and Junipero family soils in other families. Monache Variant soils, drained have a water table that fluctuates between depths of 6 and 2 feet and have faint mottles. Typic Haploxerolls soils do not have a thick mollic epipedon and have organic matter that decreases regularly as depth increases. Junipero family soils occur in montane meadows associated with Yellow Pine Forest.

Geographically associated soils: These are the Cagwin, Monache Variant, Nanny family, Chesaw family, and Toem soils, and the competing Monache Variant soils, drained. Cagwin soils have an ochric epipedon, are moderately deep, and are sandy. Nanny family soils have an umbric epipedon and are loamy-skeletal and well drained. Chesaw family soils are moderately deep, do not have a thick mollic epipedon, and are sandy-skeletal. Toem soils are shallow, have an ochric epipedon, and are sandy.

MONACHE VARIANT

The Monache Variant consists of deep, poorly drained soils on upland basins. These soils formed in alluvium derived dominantly from granitic rock. Slope ranges from 2 to 5 percent. The main plant community is Montane Meadow. The elevation is 7,200 to 8,500 feet. The average annual precipitation is 25 to 39 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are coarse-loamy, mixed, frigid Cumulic Haplaquolls.

Typical pedon of Monache Variant in a unit of Cannell-Nanny family-Monache Variant association, moderately steep, moderately steep; in Sequoia National Forest, Tulare County, Tule River Ranger District; west of Forest Service road 20S75, near the center of Coffee Mill Meadow; in the E1/2, SE1/4 of sec, 31, T.20S., R.32E. (Colors are for moist soil.)

A11-0 to 16 inches, black (2.5YR 2/0) silt loam; many very fine, fine, and medium roots; moist throughout; strongly acid.

A12-16 to 25 inches; black and very dark gray (10YR 2/1 and 3/1) silt loam; many very fine and fine roots; standing water in auger hole at 20 inches; strongly acid.

A13-25 to 37 inches; very dark gray (10YR 3/1) silt loam and strata of silty clay loam, common medium distinct reddish brown (5YR 5/3) mottles; many very fine roots and common fine and medium roots;

saturated; standing water in auger hole; strongly acid.

C-37 to 43 inches; very dark grayish brown (2.5YR 3/2) silty clay loam; common medium distinct reddish brown (5YR 5/3) mottles as above; common roots; saturated; standing water in auger hole; strongly acid.

Range in characteristics: The profile is erratically stratified with loamy sand to silty clay loam. The control section averages loam or silt loam and is less than 18 percent clay.

Some pedons are partially drained by entrenchment of the streamcourse and have annual soil temperatures that exceed 8 degrees centigrade. These differences do not affect use and management.

Competing soils: These are the Typic Haploxerolls and the Monache soils in other families. Typic Haploxerolls have a mollic epipedon less than 20 inches thick, are moderately well drained, and are neutral or mildly alkaline. Monache soils are moderately well drained and are slightly acid or neutral.

Geographically associated soils: These are the Cannell and Nanny family soils. Cannell soils have an ochric epipedon, a cambic horizon, and a paralithic contact. Nanny family soils have an umbric epipedon, a cambic horizon, are loamy-skeletal, and have a paralithic contact. Both soils are well drained.

NANNY FAMILY

The Nanny family consists of deep, well drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 2 to 50 percent. The main plant communities are Red Fir Forest, White Fir Forest, Lodgepole Pine Forest, and Montane Chaparral. The elevation is 7,200 to 9,800 feet. The average annual precipitation is 14 to 45 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are loamy-skeletal, mixed, frigid Typic Xerumbrepts.

Typical pedon of Nanny family in a unit of Sirretta-Rock outcrop Nanny family complex, 30 to 50 percent slopes; in Tulare County, California, Sequoia National Forest, Hot Springs Ranger District; on west side of Forest Service road 24S08, toward the Tobias Lookout, and south about 0.5 miles from the junction of Forest road 24S24 and 24S08; near the center of sec. 7, T.24S., R.32E.

01-1 inch to 0; red fir litter.

A1-0 to 6 inches; very dark grayish brown (10YR 3/2) stony sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine tubular and interstitial pores; 10 percent pebbles, 10 percent cobbles, and 5 percent stones; medium acid, clear wavy boundary.

B21-6 to 16 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine tubular and interstitial pores; medium acid; clear wavy boundary.

IIB22-16 to 29 inches; pale brown (10YR 6/3) extremely gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine interstitial pores and few very fine tubular pores; 35 percent pebbles, 20 percent cobbles, and 15 percent stones; medium acid; clear smooth boundary.

IIC1-29 to 42 inches; yellowish brown (10YR 5/4) very gravelly loamy fine sand, brown (10YR 5/3) moist;

massive; soft, very friable, nonsticky and nonplastic; few very fine and coarse roots; common very fine interstitial pores; 40 percent pebbles, 10 percent cobbles, and 5 percent stones; medium acid; clear smooth boundary.

IIC2-42 to 74 inches; yellowish brown (10YR 5/4) loamy fine sand, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and coarse roots; common very fine interstitial pores; slightly acid.

Range in characteristics: Depth to a paralithic contact is 59 to 78 inches. The profile ranges from 35 to 80 percent gravel, cobbles, and stones.

The A horizon has dry color of 10YR 5/3, 4/2, or 3/2 and moist color of 10YR 3/1 or 3/2. It is sandy loam or gravelly sandy loam. Base saturation is 31 percent.

The B2 horizon has dry color of 10YR 6/3 or 4/3 and moist color of 10YR 3/3, 4/3, or 5/3. It is sandy loam, gravelly sandy loam, or very gravelly fine sandy loam and is medium acid or neutral. Base saturation of the B21 horizon is 37 percent.

The C horizon has dry color of 10YR 6/3, 7/3, or 5/4 and moist color of 10YR 4/3, 5/3, or 6/3. It is gravelly sandy loam, very gravelly loamy fine sand, or loamy fine sand and is neutral or slightly acid.

Competing soils: These are the Chesaw family, Glean Variant, Jumpe family, and Sirretta soils in other families. Glean Variant soils have a mollic epipedon, are moderately deep, and do not have a cambic horizon. Jumpe family soils have an ochric epipedon and have colors redder than 7.5YR. Chesaw family soils are moderately deep, have a mollic epipedon, do not have a cambic horizon, and are sandy-skeletal. Sirretta soils have an ochric epipedon, are moderately deep, do not have a cambic horizon, and are sandy-skeletal.

Geographically associated soils: These are the Cagwin, Cannell, Kriest family, and Toem soils, and the competing Chesaw family soils. Cagwin soils are moderately deep and sandy. They have an ochric epipedon and are coarse-loamy. Kriest family soils are moderately deep, have an ochric epipedon and are coarse-loamy. Toem soils are shallow and sandy and do not have a cambic horizon.

SHAVER SERIES

The Shaver series consists of deep, well drained soils on mountain sides. These soils are formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montane Chaparral. The elevation is 4,500 to 7,500 feet. The average annual precipitation is 25 to 51 inches, and the average growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Pachic Xerumbrepts.

Typical pedon of Shaver series in a unit of Shaver-Chaix association, moderately steep. Kern County, California, Sequoia National Forest, Greenhorn Ranger District; on right side of Forest Service road 27S02, 2.5 miles southeast of Saddle Spring campground, at red metal fencepost; in the SW1/4 of sec. 13, T.28S., R.33E.

01-2 inches to 0; undecomposed and partially decomposed needles and twigs.

A11-0 to 4 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; many fine interstitial pores; 5 percent fine and very fine pebbles; slightly acid; clear smooth boundary.

A12-4 to 14 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots and few medium and coarse roots; many fine tubular and interstitial pores; 5 percent fine and very fine pebbles; slightly acid; clear smooth boundary.

A13-14 to 43 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common coarse and medium roots; common fine and medium tubu-

lar and interstitial pores; 10 percent fine and very fine pebbles; slightly acid; gradual wavy boundary.

C1-43 to 53 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few medium to coarse roots; common fine and medium tubular and interstitial pores; 20 percent fine and very fine pebbles; slightly acid.

Range in characteristics: Depth to a paralithic contact is 40 to 60 inches. The profile is slightly acid or medium acid.

The A horizon has dry color of 10YR 3/2, 4/2, 4/3, 5/2, or 5/3 and moist color of 10YR 2/1, 2/2, 3/2 or 3/3. It is fine sandy loam, sandy loam, coarse sandy loam, or loam and is less than 18 percent clay. The A horizon ranges from 20 to 39 inches in thickness.

The C horizon has dry color of 10YR 7/3, 6/3, 5/3, or 5/4 and moist color of 10YR 5/3, 4/3, or 3/3. It is sandy loam, coarse sandy loam, or gravelly coarse sandy loam.

Competing soils: These are the Cagwin Variant, Dome, Junipero family, and Wind River family soils in other families. Cagwin Variant soils have an ochric epipedon and are sandy. Dome soils have an Ochric epipedon. Junipero family soils have a thick mollic epipedon, mottles in the subsoil, and have a water table between depths of 47 and 63 inches. Wind River family soils have a mollic epipedon that is not thick.

Geographically associated soils: These are the Chaix, Holland, Hotaw, and Monache Variant soils, drained, warm, and the competing Wind River soils. The Chaix soils are moderately deep and have an ochric epipedon. Holland soils have an ochric epipedon and a fine-loamy argillic horizon. Hotaw soils are moderately deep and have an ochric epipedon and a fine-loamy argillic horizon. Monache Variant soils, drained, warm, have a thick mollic epipedon and are somewhat poorly drained.

SHAVER VARIANT

The Shaver Variant consists of moderately deep, well drained soils on foothills and mountain sides. These soils formed in residuum derived from granitic rock. Slope ranges from 30 to 50 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 2,400 to 4,400 feet. The average annual precipitation is 29 to 35 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are coarse-loamy, mixed, thermic Pachic Ultic Haploxerolls.

Typical pedon of Shaver Variant in a unit of Tollhouse Variant-Shaver Variant-Rock outcrop complex, 30 to 50 percent slopes; in Sequoia National Forest, Tule River Ranger District, Tulare County; in the NW1/4, NE1/4 of sec. 5, T.20S., R.30E.

01-1/3 inch to 0; oak and grass litter.

A11-0 to 4 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine tubular and interstitial pores; slightly acid; clear smooth boundary.

A12-4 to 8 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine and fine tubular pores; slightly acid; clear smooth boundary.

B21-8 to 20 inches; yellowish brown (10YR 5/4) sandy

loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine tubular pores; slightly acid; clear smooth boundary.

B22-20 to 24 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine tubular pores; neutral; clear smooth boundary.

Cr-29 inches; yellowish brown (10YR 5/4) decomposed granite that has rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 39 inches. The profile is slightly acid or neutral and is sandy loam or coarse sandy loam.

The A horizon has dry color of 10YR 5/3 or 5/4 and moist color of 10YR 3/2 or 3/3.

The B horizon has dry color of 10YR 5/4, 5/2, or 6/3 and moist color of 10YR 3/2, 3/3, or 3/4.

Competing soils: These are the Kanaka family soils in another family. Kanaka family soils have an ochric epipedon.

Geographically associated soils: These are the Chawanakee Variant and Tollhouse Variant family soils, and the competing Kanaka family soils. Chawanakee Variant soils have an ochric epipedon and are shallow. Tollhouse Variant soils are shallow and do not have a thick mollic epipedon.

SIRRETTA SERIES

The Sirretta series consists of moderately deep, excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Red Fir Forest, Lodgepole Pine Forest, Foxtail-Limber Pine Forest, and Montane Chaparral. The elevation is 7,500 to 9,500 feet. The average annual precipitation is 20 to 39 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are sandy-skeletal, mixed, frigid Dystric Xerothents.

Typical pedon of Sirretta series in a unit of Rock outcrop-Toem-Sirretta complex, 10 to 30 percent slopes; in Sequoia National Forest, Tulare County, Cannell Meadow Ranger District; about 30 feet north of Forest Service road 23S41, 2 miles west of the Junction with Forest Service road 22S01 and 23S01 and 23S41; in the SW1/4, SE1/4 of sec. 15, T.23S., R.33E.

A1-0 to 6 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; single grain; loose; many fine roots; many fine and medium interstitial pores; 30 percent pebbles, 15 percent cobbles and 5 percent stones; slightly acid; gradual smooth boundary.

C1-6 to 24 inches; brown (10YR 5/3) extremely cobbly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose; common medium roots; many fine and medium interstitial pores; 40 percent pebbles, 40 percent cobbles and 10 percent stones; slightly acid; gradual smooth boundary.

C2-24 to 28 inches; light yellowish brown (10YR 6/4) extremely cobbly loamy coarse sand, yellowish brown

(10YR 5/4) moist; single grain; loose; few medium and coarse roots; many fine and medium interstitial pores; 40 percent pebbles, 20 percent cobbles and 10 percent stones; medium acid; gradual smooth boundary.

R-28 inches; fractured, hard granitic rock.

Range in characteristics: Depth to a lithic contact is 20 to 39 inches. The profile ranges from 35 to 90 percent gravel, cobbles, and stones. It is slightly acid or medium acid.

The A horizon has dry color of 10YR 3/3, 4/2, or 6/3 and moist color of 10YR 2/2 or 4/3. The horizon ranges from 5 to 9 inches in thickness.

The C horizon has dry color of 10YR 6/4, 5/3, or 4/4 and moist color of 10YR 5/4, 4/4, or 4/3.

Competing soils: These are the Glean Variant, Jumpe family, Nanny family, and Chesaw family soils in other families. Glean Variant soils have a mollic epipedon and are loamy-skeletal. Jumpe family soils have a cambic horizon and are loamy-skeletal. Nanny family soils are deep, have an umbric epipedon and a cambic horizon, and are loamy-skeletal. Chesaw family soils have a mollic epipedon.

Geographically associated soils: These are the Cagwin, Cannell, Kriest family, and Toem soils, and the competing Nanny family soils. Cagwin soils are not skeletal. Cannell soils are deep, have a cambic horizon, and are coarse-loamy. Kriest family soils have a cambic horizon and are coarse-loamy. Toem soils are shallow and are not skeletal.

SISKIYOU FAMILY

The Siskiyou family consists of moderately deep, well drained to somewhat excessively drained soils on mountain sides and ridges. These soils are formed in residuum derived from granitic rock. Slope ranges from 2 to 75 percent. The main plant communities are Yellow Pine Forest and Montane Chaparral. The elevation is 4,800 to 8,000 feet. The average annual precipitation is 10 to 25 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Typic Xerochrepts.

Typical pedon of Siskiyou family in a unit of Siskiyou-Brader families-Rock outcrop complex, 5 to 30 percent slopes; in Kern County, California, Sequoia National Forest, Greenhorn Ranger District; in road bank on south side of Saddle Springs Road 17S02, about 0.1 mile northwest of saddle Springs campground road; in the NW1/4, SW1/4 of sec, 2, T,28S., R.33E.

A1-0 to 5 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine tubular and interstitial pores; 10 percent pebbles; neutral; gradual smooth boundary.

B2-5 to 23 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine tubular and interstitial pores; 20 percent pebbles; slightly acid; gradual smooth boundary.

C1-23 to 28 inches; brown (7.5YR 5/4) gravelly coarse sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine interstitial pores; 25 percent pebbles; slightly acid; gradual smooth boundary.

C2-28 inches; weathered granitic rock, mineral grains have original rock structure.

Range in characteristics: Depth to a paralithic contact is 20 to 30 inches. Texture is loam, coarse sandy loam, sandy loam, or gravelly sandy loam. The profile ranges from 2 to 30 percent gravel. The A horizon has dry color of 10YR 4/3, 5/2, 6/2, or 6/3 and moist color of 10YR 3/2, 3/3, or 4/2. It ranges from 4 to 7 inches in thickness.

The B horizon has dry color of 10YR 5/3, 6/2, or 6/3 and moist color of 10YR 4/2, 4/3, or 4/4.

Competing soils: These are the Brader family, Chaix, Chawanakee, and Dome soils in other families. The Brader family and Chawanakee soils are shallow. The Chaix and Dome soils occur in areas that receive more than 25 inches mean annual precipitation and have base saturation of less than 60 percent in some part below a depth of 10 inches. Dome soils are deep.

Geographically associated soils: These are the Cieneba and Tollhouse soils, and the competing Brader family, Chaix, and Dome soils. The Cieneba soils are shallow and thermic and do not have a cambic horizon. The Tollhouse soils have a mollic epipedon, do not have a cambic horizon, and are shallow.

TOEM SERIES

The Toem series consists of shallow, excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 75 percent. The main plant communities are Montane Chaparral, Lodgepole Pine Forest, Foxtail-Limber Pine Forest, and Red Fir Forest. The elevation is 6,400 to 10,000 feet. The average annual precipitation is 20 to 51 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are mixed, frigid, shallow Dystric Xeropsamments.

Typical pedon of Toem series in a unit of Cagwin-Toem-Rock outcrop complex, 5 to 30 percent slopes; in Tulare County, California, Sequoia National Forest, Cannell Meadow Ranger District; from intersection of Forest Service roads 21S42 and 20S96, 2 miles south on 20S96 and 30 feet east of road; about 0.25 mile east of north end of Little Horse Meadow; in the NW1/4 sec. 33, T.20S., R.34E.

A1-0 to 3 inches; dark grayish brown (10YR 4/2) loamy sand, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine interstitial pores; 10 percent fine and very fine pebbles; medium acid; clear smooth boundary.

C1-3 to 19 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium, fine, and very fine roots; many fine and very fine interstitial

pores; 7 percent fine and very fine pebbles; medium acid; abrupt wavy boundary.

C2r-19 inches; multicolored highly weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 4 to 20 inches. The profile ranges from 5 to 20 percent gravel.

The A horizon has dry color of 10YR 4/2, 5/2, 5/3, 6/2, or 6/3 and moist color of 10YR 2/2, 3/2, 3/3, 4/2, or 4/3.

The C horizon has dry color of 10YR 5/3, 5/4, 6/3, 6/4, 7/3, or 7/4 and moist color of 10YR 4/3, 4/4, 5/3, or 5/4.

Competing soils: These are the Cagwin, Cagwin Variant, Chawanakee, Chesaw family, and Tollhouse soils in other families. Cagwin soils are moderately deep. Cagwin Variant soils are deep. Chawanakee soils are coarse-loamy and occur in the lower montane associated with Yellow Pine Forest. Chesaw family soils have a mollic epipedon and are sandy-skeletal. Tollhouse soils have a mollic epipedon, are loamy, and occur under Pinon-Juniper Woodland and Sagebrush Scrub communities.

Geographically associated soils: These are the Cannell, Nanny family, and Sirretta soils, and the competing Cagwin and Chesaw family soils. Cannell soils are deep and coarse-loamy. Nanny family soils are deep, have an umbric epipedon, and are loamy-skeletal. Sirretta soils are moderately deep and sandy-skeletal.

TOLLHOUSE SERIES

The Tollhouse series consists of shallow, somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock or metamorphic rock. Slope ranges from 5 to 75 percent. The main plant communities are Pinyon-Juniper Woodland and Sagebrush Scrub. The elevation is 4,400 to 8,800 feet. The average annual precipitation is 12 to 23 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are loamy, mixed, mesic, shallow Entic Haploxerolls.

Typical pedon of Tollhouse series in a unit of Tollhouse-Rock outcrop complex, 50 to 75 percent slopes; in Sequoia National Forest, Kern County, Cannell Meadow Ranger District; from Highway 178 in sec. 22, T.26S., R.37E., southwest 1.8 miles on dirt road to the eastern Forest boundary; in the SE1/4, NE1/4 of sec. 29, T.26S., R.37E.

A11-0 to 8 inches; brown (10YR 5/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 10 percent pebbles; neutral; clear smooth boundary.

A12-8 to 17 inches; brown (10YR 5/3) coarse sandy loam, dark brown (10YR 3/3) moist; weak medium

subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and coarse roots; common very fine and fine interstitial pores; 10 percent pebbles; neutral; abrupt smooth boundary.

Cr-17 inches; highly weathered granitic material that has relic rock structure.

Range in characteristics: Depth to a paralithic contact is 8 to 19 inches. The profile ranges from 5 to 20 percent gravel.

The A horizon has dry color of 4/2, 5/2, or 5/3 and moist color of 10YR 3/1, 3/2, or 3/3. The profile is coarse sandy loam, sandy loam, or silt loam and is 5 to 25 percent clay. The profile is slightly acid or neutral.

Competing soils: These are the Chawanakee, Cieneba, and Tollhouse Variant soils in other families. Chawanakee soils have an ochric epipedon and a cambic horizon. Cieneba soils have an ochric epipedon and occur under Foothill Woodland and Mixed Chaparral communities. Tollhouse Variant soils occur under Foothill Woodland and Mixed Chaparral communities.

Geographically associated soils: These are the Chaix soils, and the competing Chawanakee and Cieneba soils. Chaix soils are moderately deep and have an ochric epipedon and a cambic horizon.

TOLLHOUSE VARIANT

The Tollhouse Variant consists of shallow, somewhat excessively drained soils on mountain sides and ridges. These soils formed in residuum derived from granitic rock. Slope ranges from 30 to 50 percent. The main plant communities are Foothill Woodland and Mixed Chaparral. The elevation is 2,400 to 4,400 feet. The average annual precipitation is 29 to 35 inches, and the average annual growing season is 180 to 300 days.

Taxonomic class: These soils are loamy, mixed, thermic, shallow Entic Haploxerolls.

Typical pedon of Tollhouse Variant in a unit of Tollhouse Variant-Shaver Variant-Rock outcrop complex, 30 to 50 percent slopes; in Sequoia National Forest, Tule River Ranger District, Tulare County; about 0.5 miles east of Forest boundary on Bear Creek road to private road in section 5 and north on private road to Forest entry sign located on left side of road; in the SE1/4, NW1/4 of sec. 5, T.20S., R.30E.

01-1 inch to 0; oak and grass litter.

A11-0 to 5 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots and few fine and medium roots; few very fine tubular pores and many very fine interstitial pores; neutral; clear smooth boundary.

A12-5 to 11 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots and few medium roots; common very fine tubular pores; slightly acid; clear smooth boundary.

C1-11 to 16 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, medium, and coarse roots; common very fine and fine horizontal tubular pores; slightly acid; clear smooth boundary.

C2r-16 inches; yellowish brown (10YR 5/4) highly weathered granite.

Range in characteristics: Depth to a paralithic contact is 7 to 16 inches. The profile is sandy loam or coarse sandy loam and is slightly acid or neutral. The horizon ranges from 7 to 11 inches in thickness.

The A horizon dry color of 10YR 5/2 or 5/3 and moist color of 10YR 3/2 or 3/3.

Competing soils: These are the Chawanakee Variant, Cieneba, Millerton family, and Tollhouse soils in other families. Chawanakee Variant soils have an ochric epipedon and a cambic horizon. Cieneba soils have an ochric epipedon. Millerton family soils have an ochric epipedon and a lithic contact. Tollhouse soils occur under Pinyon-Juniper Woodland and Sagebrush Scrub communities.

Geographically associated soils: These are the Shaver Variant and Kanaka family soils, and the competing Chawanakee Variant soils. Shaver Variant soils are moderately deep and have a thick mollic epipedon and have a cambic horizon. Kanaka family soils are moderately deep and have an ochric epipedon and a cambic horizon.

TYPIC HAPLOXEROLLS

The Typic Haploxerolls consist of moderately deep, moderately well drained soils on the edges of upland basins. These soils formed in alluvium derived from granitic rock. Slope ranges from 0 to 15 percent. The main plant community is Montane Meadow. The elevation is 7,500 to 8,000. The average annual precipitation is 12 to 18 inches, and the average annual growing season is 90 to 135 days.

Taxonomic class: These soils are Typic Haploxerolls.

Typical pedon of Typic Haploxerolls in a unit of Monache-Typic Haploxerolls-Cagwin Variant association, sloping; in Inyo National Forest, Tulare County, Mt. Whitney Ranger District; on the west edge of the meadow through which the South Fork Kern River flows; in the NW1/4, SE1/4, NE1/4 of sec. 33, T.19S., R.35E.

01-1 inch to 0; dead grass litter.

A1-0 to 14 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine and very fine tubular and interstitial pores; neutral; clear smooth boundary.

B2-14 to 25 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; few common distinct yellowish brown (10YR 5/6) mottles, strong brown (7.5YR 5/6) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; many very fine and

fine tubular and interstitial pores; neutral; abrupt smooth boundary.

IIC-25 to 39 inches; multicolored, mottled very gravelly coarse sand; single grain; very few very fine roots; 40 percent pebbles; mildly alkaline.

Range in characteristics: The solum ranges from 20 to 35 inches in thickness. It ranges from 0 to 15 percent rock fragments. The substratum ranges from 35 to 50 percent rock fragments. The profile is slightly acid to mildly alkaline. The A horizon is loam, sandy loam, or fine sandy loam. The B horizon is fine sandy loam or sandy loam. The IIC horizon is gravelly loamy sand or very gravelly coarse sand.

Competing soils: These are the Monache Variant, Monache, and Monache Variant soils, drained, in other families. Monache Variant soils are poorly drained, have a thick mollic epipedon, and are strongly acid. Monache soils have a thick mollic epipedon, an irregular decrease in organic matter as depth increases, and are slightly acid or neutral. Monache Variant soils, drained, have a thick mollic epipedon, are somewhat poorly drained, and are slightly acid or neutral.

Geographically associated soils: These are the Cagwin Variant, Nanny family, and Chesaw family soils, and the competing Monache soils. Cagwin Variant soils are excessively drained and sandy. Nanny family soils are well drained and loamy-skeletal. Chesaw family soils are moderately deep, sandy-skeletal, and excessively drained.

WIND RIVER FAMILY

The Wind River family consists of deep, well drained and moderately well drained soils on mountain sides and ridges. These soils formed in residuum derived from metamorphic, metasedimentary, and granitic rock. Slope ranges from 5 to 50 percent. The main plant communities are Yellow Pine Forest, Mixed Conifer Forest, and Montane Chaparral. The elevation is 4,700 to 7,500 feet. The average annual precipitation is 21 to 51 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are coarse-loamy, mixed, mesic Ultic Haploxerolls.

Typical pedon of Wind River family in a unit of Wind river Family-Rock outcrop association, moderately steep; in the Piute Mountains in Sequoia National Forest, Kern County, Greenhorn Ranger District; 150 feet north of Forest Service road 27S02, about 2 miles southeast of the junction with Forest Service road 28S18 to Brown Meadow; in the NE1/4, SW1/4 of sec. 25, T.28S., R.33E.

01-1 inch to 0; decomposing pine and fir litter.

A1-0 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many fine tubular pores; 5 percent pebbles; slightly acid; clear wavy boundary.

B2-12 to 22 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and coarse roots; common fine tubular pores; 10 percent pebbles; slightly acid; clear wavy boundary.

B3-22 to 32 inches; strong brown (7.5YR 5/6) gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and coarse roots; common fine tubular pores; few

thin clay films on faces of peds; 20 percent pebbles and 10 percent cobbles; slightly acid; clear wavy boundary.

C1-32 to 42 inches; pinkish gray (7.5YR 6/2) very gravelly sandy loam, brown (7.5YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few coarse roots; few medium tubular pores; 40 percent pebbles and 35 percent cobbles; slightly acid; clear wavy boundary.

C2r-42 inches; fractured metasedimentary rock.

Range in characteristics: Depth to a paralithic contact is 39 to 78 inches. The solum ranges from 5 to 20 percent gravel. The substratum ranges from 5 to 75 percent gravel and cobbles. The profile is medium acid or slightly acid.

The A horizon has dry color of 10YR 5/2, 5/3, 4/3, or 4/4 and moist color of 7.5YR 3/2 or 3/4 or 10YR 3/3 or 3/2. It is coarse sandy loam, sandy loam, or loam.

The B horizon has dry color of 10YR 6/3, 4/3, or 4/4 7.5YR 4/4 or 5/4 and moist color of 7.5YR 4/4 or 10YR 4/2, 4/3, or 3/3. It is loam, very fine sandy loam, sandy loam, or gravelly coarse sandy loam and is less than 18 percent clay.

Competing soils: These are the Chaix, Dome, Junipero family, and Shaver soils in other families. Chaix soils are moderately deep and have an ochric epipedon. Dome soils have an ochric epipedon. Junipero family soils have a thick mollic epipedon and are moderately well drained. Shaver soils have a thick umbric epipedon.

Geographically associated soils: These are the Baldmountain, Chawanakee, and Woolstalf soils, and the competing Chaix, Dome, and Shaver soils. Baldmountain soils occur under the upper montane communities of Red Fir Forest and White Fir Forest. Chawanakee soils are shallow and have an ochric epipedon. Woolstalf soils have a thick mollic epipedon and are loamy-skeletal.

WOOLSTALF SERIES

The Woolstaff series consists of deep, well drained soils on mountain sides and ridges. These soils formed in residuum derived from metasedimentary rock. Slope ranges from 5 to 75 percent. The main plant communities are Yellow Pine Forest, White Fir Forest, and Montana Chaparral. The elevation is 5,100 to 7,500 feet. The average annual precipitation is 20 to 43 inches, and the average annual growing season is 120 to 210 days.

Taxonomic class: These soils are loamy-skeletal, mixed, mesic Pachic Ultic Haploxerolls.

Typical pedon of Woolstalf series in a unit of woolstalf-Rock outcrop complex, 30 to 50 percent slopes; in Kern County, California, Sequoia National Forest, Greenhorn Ranger District, Piute Mountains; on Forest Service road 26S01, 2.8 miles north of junction with Forest Service road 28S01, then 100 feet west of road; in the SE1/4, NW1/4 of sec. 29, T.28S., R.34E.

O1-1 inch to 0; decomposing pine and fir needles.

A1-0 to 6 inches; dark brown (10YR 4/3) gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many very fine roots; many fine interstitial pores; 30 percent pebbles; slightly acid; clear smooth boundary.

A12-6 to 15 inches; dark brown (10YR 4/3) gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many fine roots; many fine interstitial pores; 30 percent pebbles; medium acid; clear smooth boundary.

A13-15 to 36 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine to coarse roots; many fine interstitial pores; 40 percent pebbles; medium acid; clear smooth boundary.

B2-36 to 58 inches; yellowish brown (10YR 5/4) extremely gravelly fine sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse roots; common fine interstitial pores; 75 percent pebbles; medium acid; clear smooth boundary.

Cr-58 inches; weathered metasedimentary rock that has original rock structure.

Range in characteristics: Depth to a paralithic contact is 39 to 59 inches. The profile ranges from 35 to 75 percent gravel. It is gravelly fine sandy loam, and very gravelly fine sandy loam, or very gravelly loam and is 10 to 18 percent clay.

The A1 horizon has dry color of 10YR 5/2, 5/3, 4/2, or 4/3 and moist color of 10YR 3/2, or 3/3 or 7.5YR 3/2.

The B2 horizon has dry color of 10YR 5/4 or 4/4 or 7.5YR 5/6 or 4/4, and moist color of 10YR 3/4 or 4/3 or 7.5YR 3/2, 3/4, or 5/6.

Competing soils: These are the Chesaw family, Glean Variant, Jumpe family, Livermore family, Nanny family and Sirretta soils in other families. Chesaw family, Glean Variant, Nanny family, Jumpe family occur under montane communities of Red Fir Forest and White Fir-Sugar Pine Forest. Chesaw family and Glean Variant soils do not have a thick mollic epipedon nor a cambic horizon. Jumpe family soils have an ochric epipedon. Nanny family soils have an umbric epipedon. Livermore family soils do not have a thick mollic epipedon and occur on Foothill Woodland and Mixed Chaparral.

Geographically associated soils: These are the Baldmountain, Chaix, Chawanakee, and Dome soils. Baldmountain soils are not pachic nor skeletal. Chaix soils have an ochric epipedon, are moderately deep, and are coarse-loamy. Chawanakee soils are shallow, have an ochric epipedon, and are coarse-loamy. Dome soils have an ochric epipedon and are coarse-loamy.

XEROFLUENTS

These lands occur as recent alluvium adjacent to the Kern River and its tributaries. They are deep gravelly, cobbly, and stony sands and sandy loams and have many stones and boulders on the surface. Slopes are 0 to 15 percent.

These lands have been recently deposited by streams and are subject to change by stream overflow, erosion, and

deposition. They are poorly to somewhat excessively drained and have medium to rapid runoff. Erodibility is high.

Some of these lands are used for recreation. Numerous campgrounds adjacent to the Kern River are located on these lands.

XERORTHENTS

These lands consists of moderately steep and steep areas of unconsolidated recent colluvium. They are varying textures of soil material and rock fragments. They

do not have distinct soil horizons. Slopes are 5 to 50 percent. They are well to somewhat excessively drained and have medium to rapid runoff. Erodibility is high.

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Glossary

Alluvial fan: A body of alluvium whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a plain.

Alluvium: Material, such as clay, silt, and sand deposited by streams.

Association, soil: A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Base saturation: The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of calcium, magnesium, sodium, and potassium), expressed as a percentage of the total cation exchange capacity.

Basic igneous rock: Rock formed from the cooling and solidification of magma and has not been changed appreciably since its formation. It is high in content of iron and magnesium.

Bedrock: The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulder: Rock fragments larger than 60 centimeters in diameter.

Canyon: A long, deep, narrow, very steep sided valley with high and precipitous walls in an area of high local relief.

Clay: As a soil separate, the mineral soil particle less than 0.002 millimeters in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay skin: A thin coating of oriented clay on the surface of a soil aggregate, or lining pores or root channels. Synonyms: clay coating, clay film.

Coarse fragments: Rock or mineral particles 2 millimeters to 25 centimeters in diameter.

Cobbles: Rounded or partially rounded fragments of rock 7.5 to 25 centimeters in diameter.

Colluvium: Soil material, rock fragments, or both

moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil: A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practicable to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Consistence, soil: The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose - Noncoherent when dry or moist; does not hold together in a mass.

Friable - When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm - When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic - When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky - When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard - When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft - When dry, breaks into powder or individual grains under very slight pressure.

Cemented - Hard; little affected by moistening.

Culmination Mean Annual Increment (CMAI):
The point where a stand reaches its maximum annual rate of growth. The main annual increment is computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase.

Deep: As soil depth classification, greater than 100 centimeters.

Effective rooting depth: The vertical distance from the soil surface to bedrock or any other layer that stops or hinders the penetration of roots.

Erosion: The wearing away of the land surface by water, wind, ice or other geologic agents and by such processes as gravitational creep.

Forb: Any herbaceous plant not a grass or a sedge.

Glacial till: Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders deposited by transported glacial ice.

Gravel: Rounded or angular rock fragments from 2 millimeters to 7.5 centimeters in diameter; an individual piece is a pebble.

Ground Water: Water filling all unblocked pores of underlying material below the water table.

Gully: A steep sided depression cut by running water larger than 10 centimeters deep and 15 centimeters wide.

Horizon, soil: A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon - An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon - The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material.

B horizon - The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in a A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon - The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C

horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R horizon - Consolidated rock beneath the soil. The rock commonly underlies a C horizon.

Infiltration: The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Lithic contact: Boundary between soil and underlying rock which is a barrier to root penetration and water movement. Rock is essentially unweathered and can only be chipped by a spade.

Loam: Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Metamorphic rock: Rock of any origin altered in mineralogical composition, chemical compositions, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil: Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Moderately deep: As a soil depth classification, between 50 and 100 centimeters.

Mottling soil: Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage.

Nutrient, plant: Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter: Plant and animal residue in the soil in various stages of decomposition.

Paralithic contact: Boundary between soil and underlying weathered rock which is a barrier to root penetration and water movement. Material retains rock structure but when moist can be dug with a spade.

Ped: An individual natural soil aggregate, such as a prism, block, or granule.

Pedon: The smallest volume that can be called "a soil". A pedon is three dimensional and large enough to permit a study of all horizons. Its area ranges from about 1 square meter to 10 square meters, depending on the variability of the soil.

Percolation: The downward movement of water through the soil.

Permeability: The quality of the soil that enables water to move downward through the profile.

Productivity, soil: The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil: A verticle section of the soil extending through all its horizons and into the parent material.

Reaction: A measure of acidity or alkalinity of the soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as: Extremely acid - below 4.5; Very strongly acid, 4.5-5.0; Strongly acid, 5.1-5.5; Medium acid, 5.6-6.0; Slightly acid, 6.1-6.5; Neutral, 6.6-7.3; Mildly alkaline, 7.4-7.8; Moderately alkaline, 7.9-8.4; Strongly alkaline, 8.5 to 9.0; Very strongly alkaline, higher than 9.0.

Rill: A steep sided channel in the soil surface less than 10 centimeters deep and 15 centimeters wide caused by the washing away of soil material.

Rock fragments: Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Sand: As a soil separate, individual rock or mineral fragments from 0.05 millimeters to 2.0 millimeters in diameter. As a soil textural class, a soil that is 85 percent or more sand, and not more than 10 percent clay.

Series, soils: A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shallow: As a soil depth classification, less than 50 centimeters.

Silt: As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002

millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope: The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100.

Solum: The upper part of a soil profile, above the C horizon in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plants and animal activities are largely confined to the solum.

Spring-summer range: Annual grasslands grazed in spring and early summer.

Stones: Rock fragments 25 to 60 centimeters in diameter.

Structure, soil: The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are: platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), Blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil: Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum: The part of the soil below the solum.

Summer range: Perennial grasslands and mountain meadows grazed during summer months.

Talus: Fragments of rock and other soil material accumulated at the foot of cliffs or steep slopes

Taxadjuncts: Soils that cannot be classified into a recognized series in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine: A belt of thick glacial drift that generally marks the termination of important glacial advances.

Texture, soil: The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, silty clay loam. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine"

Toe slopes: The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil: The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter.

Upland: Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant: A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Water table: The upper surface of ground water or that level below which soil is saturated with water.

Watershed: The total area above a given point on a stream that contributes water to the flow at that point.

Weathering: All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

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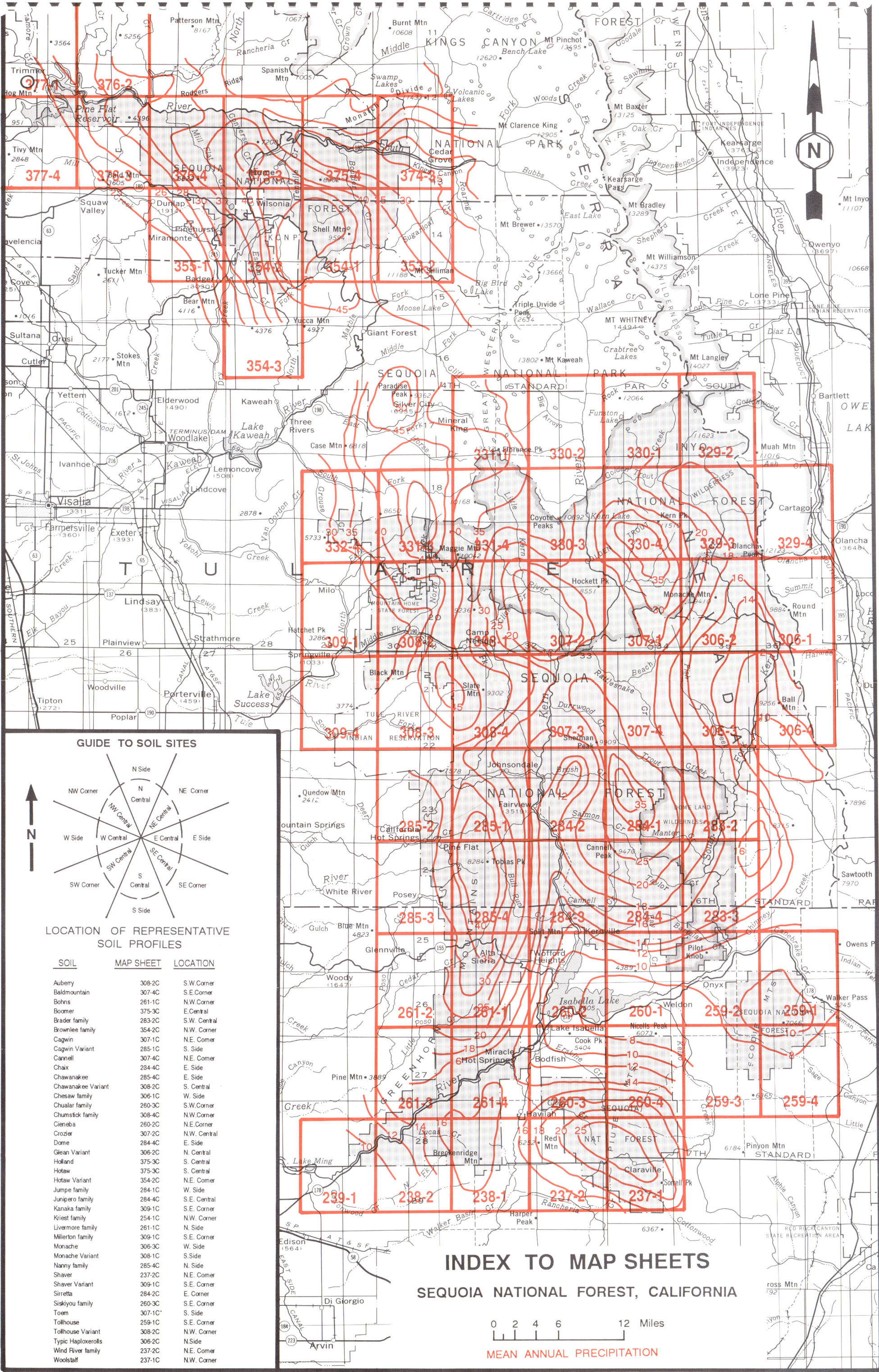
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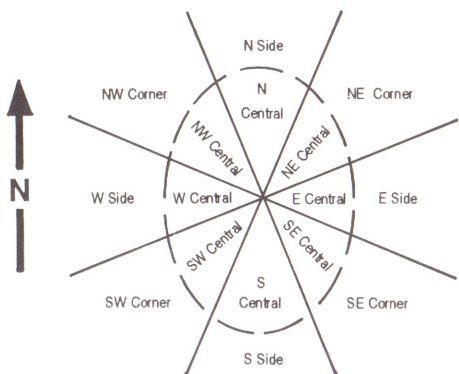
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Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;
- (2) fax: (202) 690-7442; or
- (3) email: program.intake@usda.gov.

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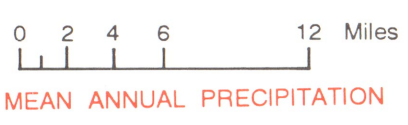
GUIDE TO SOIL SITES

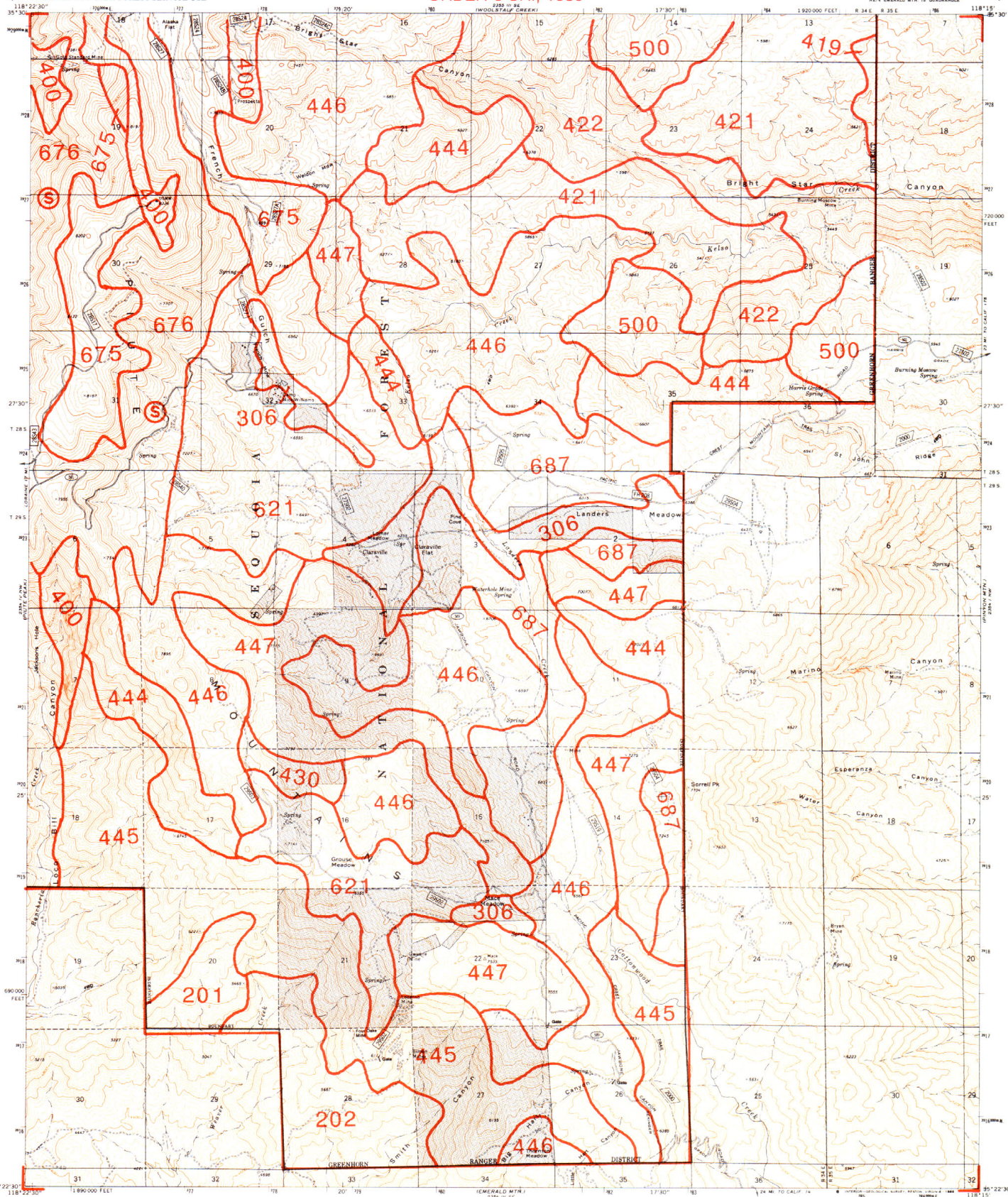


LOCATION OF REPRESENTATIVE SOIL PROFILES

| SOIL | MAP SHEET | LOCATION |
|--------------------|-----------|--------------|
| Auberry | 308-2C | S.W. Corner |
| Baldmountain | 307-4C | S.E. Corner |
| Bohns | 261-1C | N.W. Corner |
| Boomer | 375-3C | E. Central |
| Brader family | 283-2C | S.W. Central |
| Brownlee family | 354-2C | N.W. Corner |
| Cagwin | 307-1C | N.E. Corner |
| Cagwin Variant | 285-1C | S. Side |
| Cannell | 307-4C | N.E. Corner |
| Chair | 284-4C | E. Side |
| Chawanakee | 285-4C | E. Side |
| Chawanakee Variant | 308-2C | S. Central |
| Chesaw family | 306-1C | W. Side |
| Chualar family | 260-3C | S.W. Corner |
| Chumstick family | 308-4C | N.W. Corner |
| Cienega | 260-2C | N.E. Corner |
| Crozier | 307-2C | N.W. Central |
| Dome | 284-4C | E. Side |
| Glean Variant | 306-2C | N. Central |
| Holland | 375-3C | S. Central |
| Hotaw | 375-3C | S. Central |
| Hotaw Variant | 354-2C | N.E. Corner |
| Jumpe family | 284-1C | W. Side |
| Junipero family | 284-4C | S.E. Central |
| Kanaka family | 309-1C | S.E. Corner |
| Kriest family | 254-1C | N.W. Corner |
| Livermore family | 261-1C | N. Side |
| Millerton family | 309-1C | S.E. Corner |
| Monache | 306-3C | W. Side |
| Monache Variant | 308-1C | S. Side |
| Nanny family | 285-4C | N. Side |
| Shaver | 237-2C | N.E. Corner |
| Shaver Variant | 309-1C | S.E. Corner |
| Sirretta | 284-2C | E. Corner |
| Siskiyou family | 260-3C | S.E. Corner |
| Toam | 307-1C | S. Side |
| Tollhouse | 259-1C | S.E. Corner |
| Tollhouse Variant | 308-2C | N.W. Corner |
| Typic Haploxerolls | 306-2C | N. Side |
| Wind River family | 237-2C | N.E. Corner |
| Woolstall | 237-1C | N.W. Corner |

INDEX TO MAP SHEETS
SEQUOIA NATIONAL FOREST, CALIFORNIA





Base map prepared by the U.S. Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1970. Field checked 1972
Projection and 10,000-foot grid ticks: California coordinate system, zone 5, (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American datum

Additional revisions by the U.S. Geological Survey from 1963 aerial photographs and other source data. Partial field check by USDA Forest Service. Map edited 1969

Modification to USGS base map by the Geomatics Service Center from 1962 and 1963 aerial photography and 1964 correction guides furnished by the FS Pacific Southwest Region

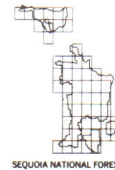


- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

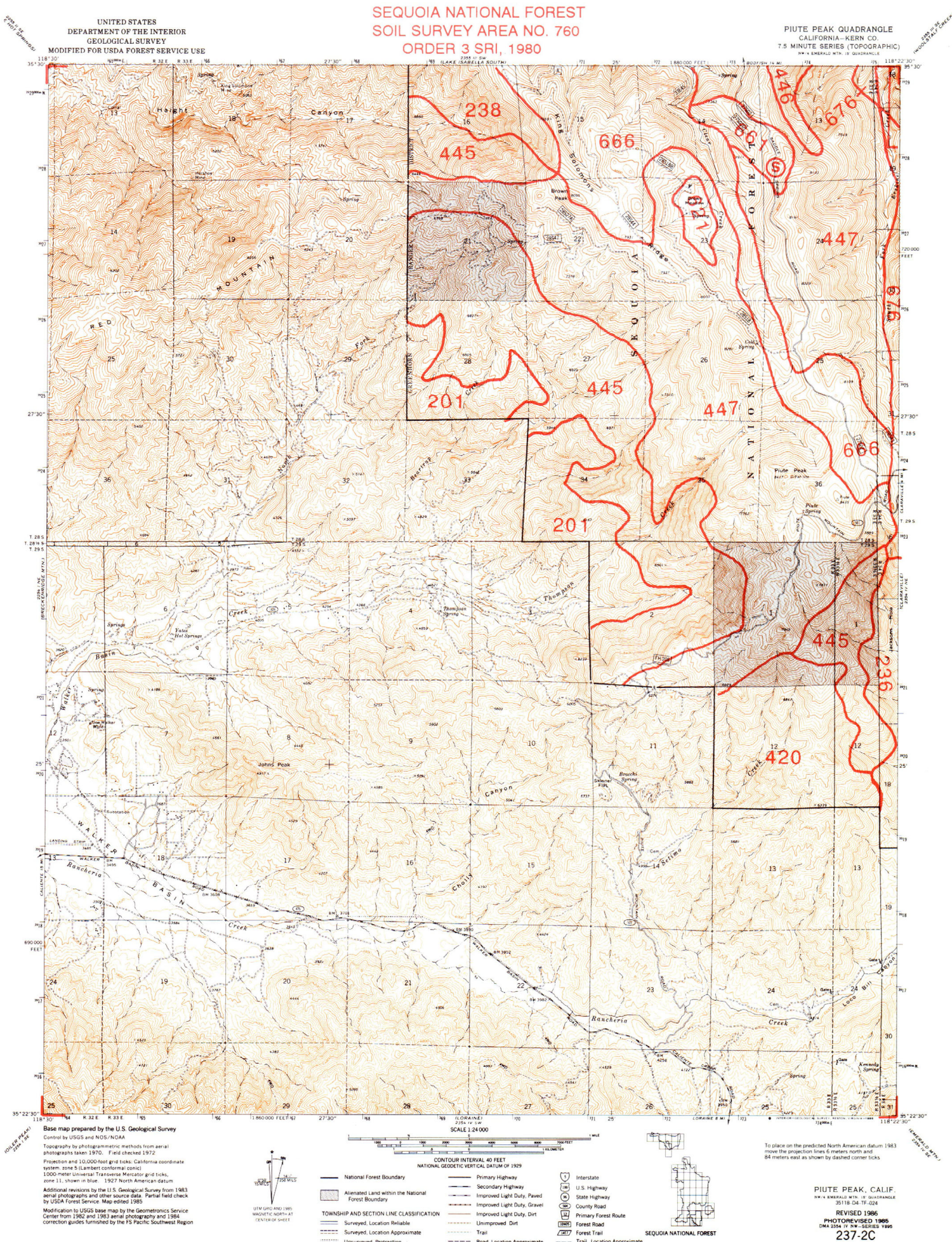
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Unimproved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate



To place on the predicted North American datum 1983 move the projection lines 7 meters north and 84 meters east as shown by dashed corner ticks



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

PIUTE PEAK QUADRANGLE
CALIFORNIA-KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

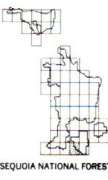
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000-foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the IS Pacific Southwest Region

- National Forest Boundary**
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

- CONTOUR INTERVAL 40 FEET**
- Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate

- Interstate**
- U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Road
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate



To place on the predicted North American datum 1983
move the projection lines 6 meters north and
84 meters east as shown by dashed corner ticks

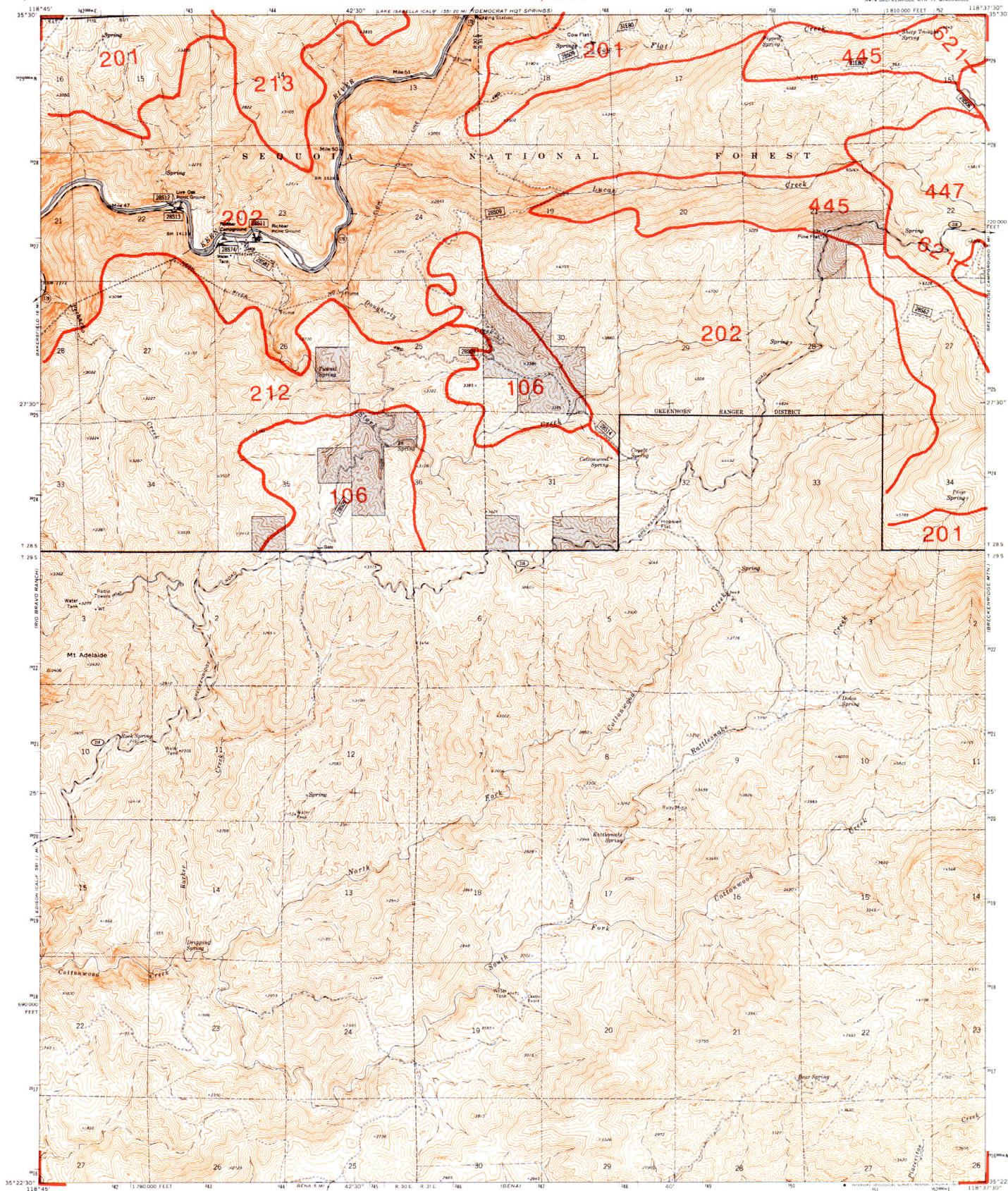
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REVISED 1986
PHOTOREVISED 1985
DMA 2354 IV NW-SERIES 1985
237-2C



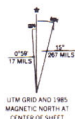
REVISED 1986
PHOTOREVISED 1985

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

MT. ADELAIDE QUADRANGLE
CALIFORNIA—KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
N 3522.5—W 11837.5/5



Base map prepared by the U.S. Geological Survey
Conform to USGS and NOAA NAD84
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000-foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Modification to USGS base map by the Geomorphics Service
Center from 1962 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
--- Surveyed, Location Approximate
..... Unsurveyed, Protraction

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
— Primary Highway
— Secondary Highway
— Improved Light Duty, Paved
— Improved Light Duty, Gravel
— Improved Light Duty, Dirt
— Unimproved Dirt
— Trail
— Road, Location Approximate

Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



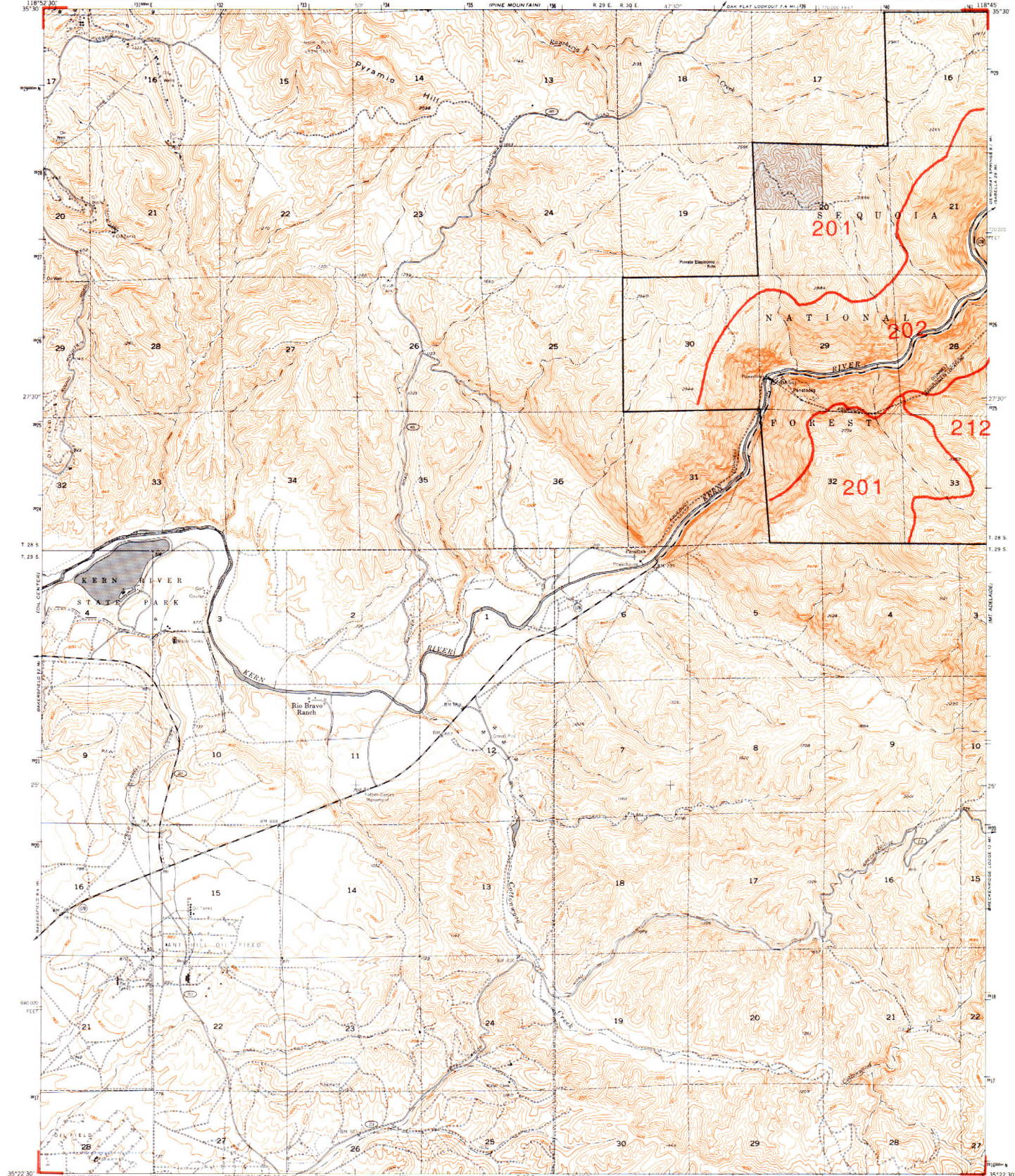
SEQUOIA NATIONAL FOREST

MT. ADELAIDE, CALIF.
N 3522.5—W 11837.5/5
REVISED 1986
DMA 2284 | NW, 5/2 SERIES 1985
238-2C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

RIO BRAVO RANCH QUADRANGLE
CALIFORNIA, KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
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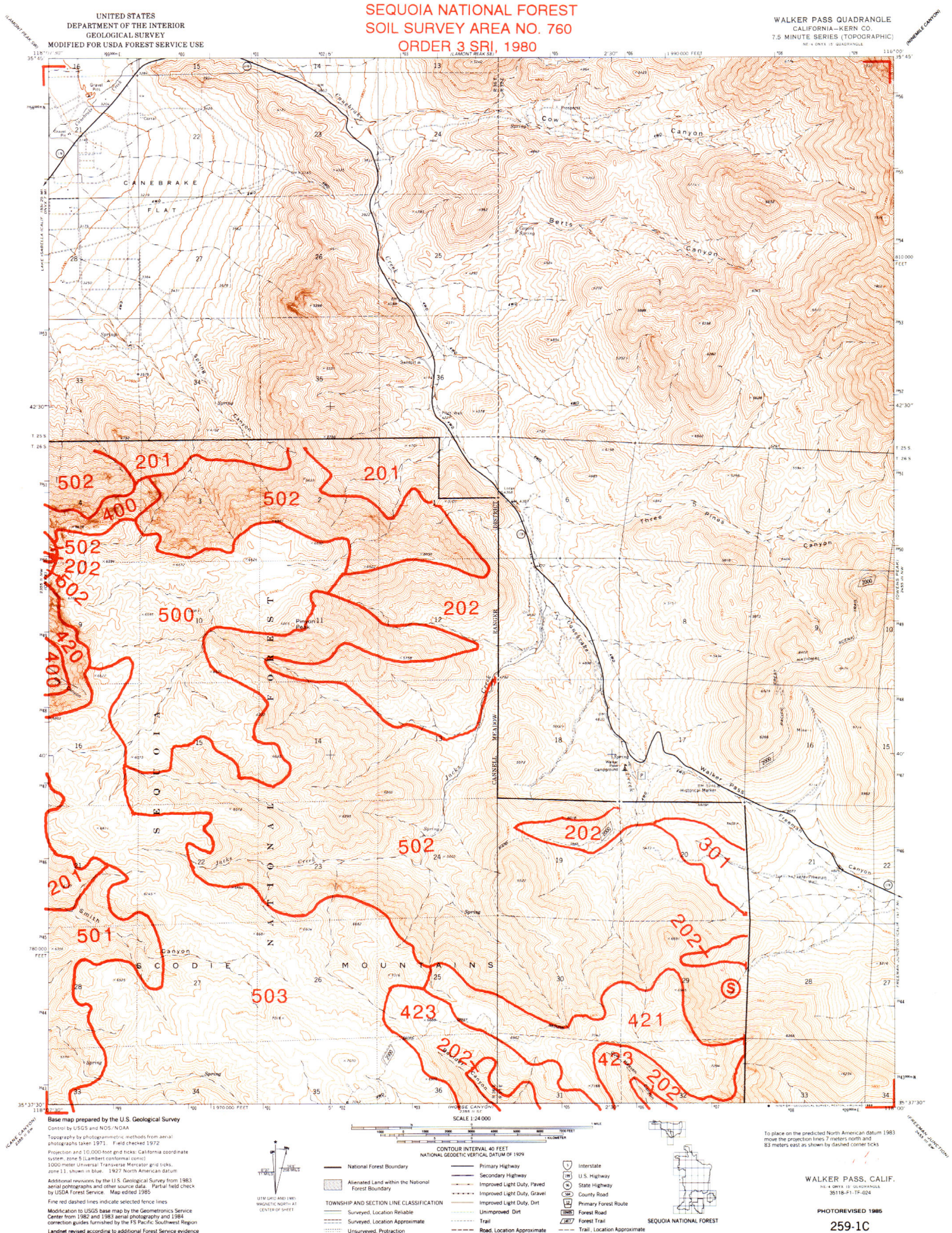
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Control by USGS and USFS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1942-1943. Field check 1944
Polyconic projection, 1907 North American datum
10,000-foot grid based on California coordinate system, zone 4
Unchecked elevations are shown in brown
1000 meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue
Modification to USGS base map by the Geomorphics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- SCALE 1:24,000
- CONTOUR INTERVAL 40 FEET
DASHED LINES REPRESENT HALF INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL
- National Forest Boundary
Allocated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protection
- Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate
- Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



RIO BRAVO RANCH, CALIF.
N3522 5/W11845/7.5
REVISED 1985



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

WALKER PASS QUADRANGLE
CALIFORNIA-KERN CO
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE 4 DATA 15 QUADRANGLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

Base map prepared by the U.S. Geological Survey
Control by USGS and NGS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1971. Field checked 1972.
Projection and 10,000-foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum.
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985.
Fine red dashed lines indicate selected fence lines.
Modification to USGS base map by the Geometrics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the US Pacific Southwest Region.
Landmark revised according to additional Forest Service evidence.



- SCALE 1:24,000
- CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC DATUM OF 1929
- | | |
|------------------------------------------------------|-------------------------------|
| — National Forest Boundary | — Primary Highway |
| — Alienated Land within the National Forest Boundary | — Secondary Highway |
| — Township and Section Line Classification | — Improved Light Duty, Paved |
| — Surveyed, Location Reliable | — Improved Light Duty, Gravel |
| — Surveyed, Location Approximate | — Improved Light Duty, Dirt |
| — Unsurveyed, Protraction | — Unimproved Dirt |
| | — Trail |
| | — Road, Location Approximate |
| | — Trail, Location Approximate |
- Legend:
- Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Route
 - Forest Road
 - Forest Trail
 - Trail



To place on the predicted North American datum 1983
move the projection lines 7 meters north and
83 meters east as shown by dashed corner ticks

WALKER PASS, CALIF.
NE 4 DATA 15 QUADRANGLE
2018-F1-TP-028

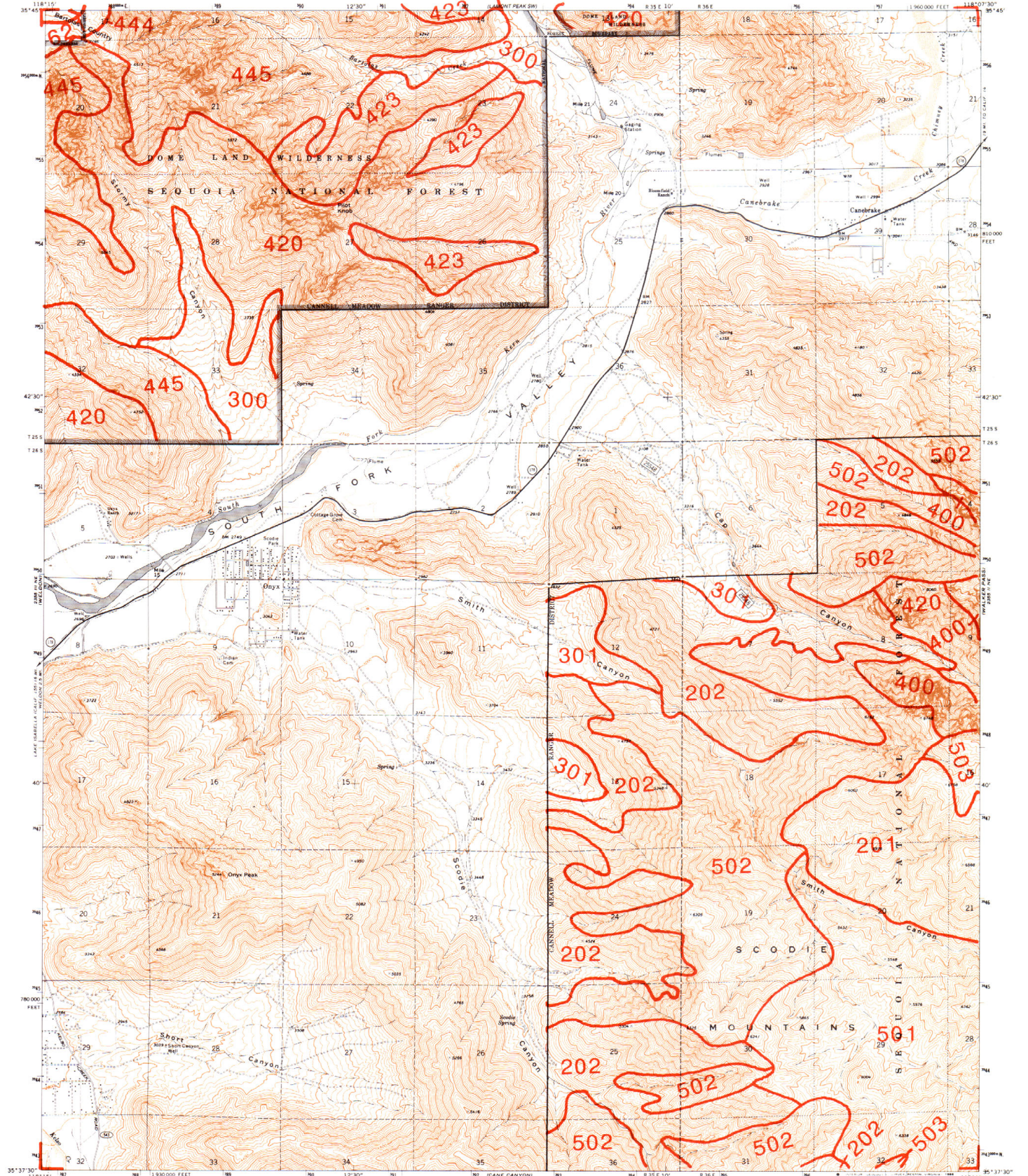
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259-1C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

ONYX QUADRANGLE
CALIFORNIA—KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NW 4 ONYX 15 QUADRANGLE
1:50,000 FEET



Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1971. Field checked 1972
Projection and 10,000-foot grid ticks: California coordinate system, zone 10 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American datum
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Modification to USGS base map by the Geomorphics Service Center from 1985 and 1988 aerial photography and 1984 correction guides furnished by the FS Pacific Southwest Region
Landnet revised according to additional Forest Service evidence

SCALE 1:24,000

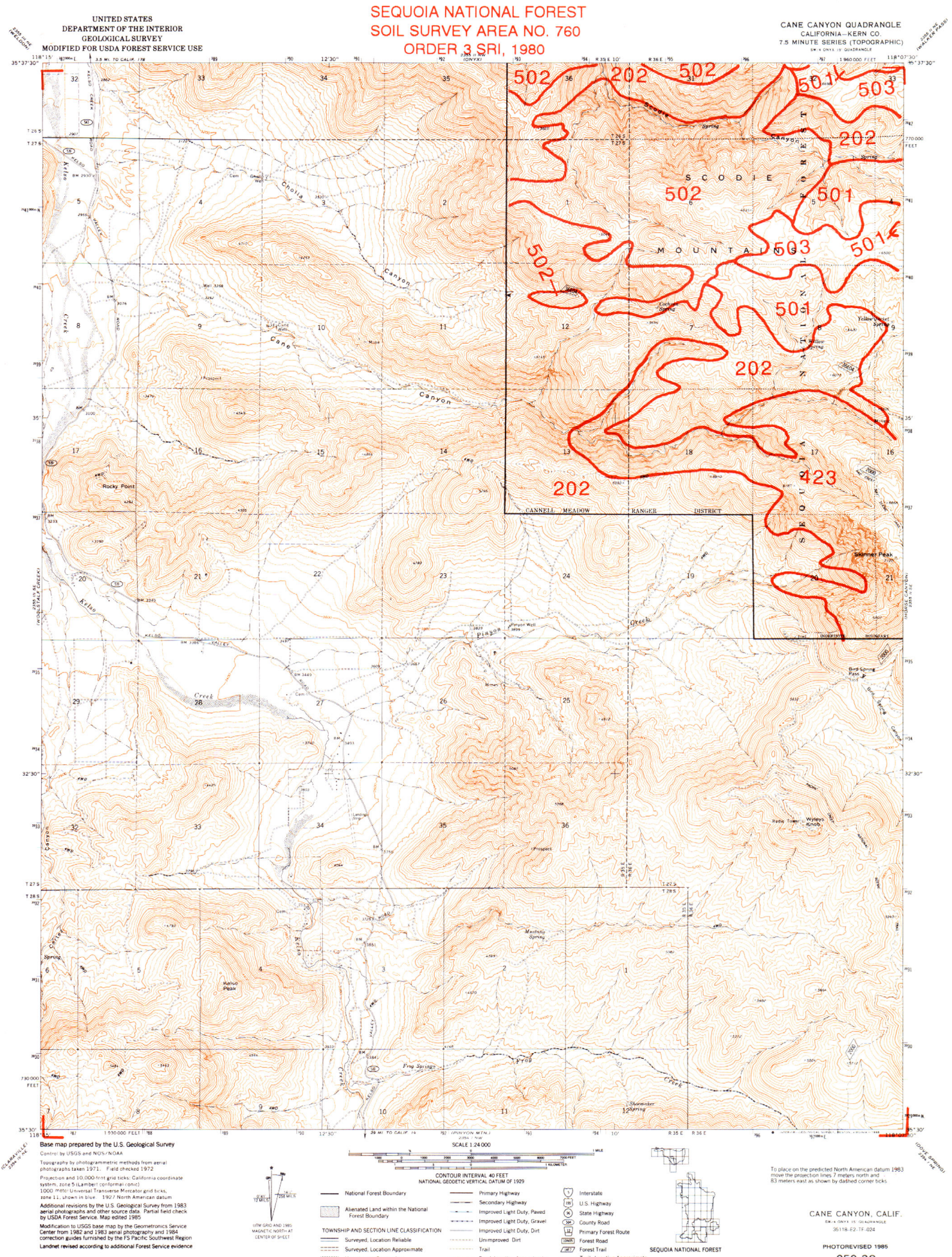
CONTOUR INTERVAL 40 FEET
SUPPLEMENTARY CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Legend:

- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate

SEQUOIA NATIONAL FOREST

ONYX, CALIF.
NW 4 ONYX 15 QUADRANGLE
35118-F2-TF-024
PHOTOREVISED 1985
259-2C



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

CANE CANYON QUADRANGLE
CALIFORNIA—KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW 4 COR. 17 QUADRANGLE

Base map prepared by the U.S. Geological Survey
Control by USGS and NOAA

Topography by photogrammetric methods from aerial
photographs taken 1971. Field checked 1972
Projection and 10,000 ft grid ticks, California coordinate
system, Zone 5 (Lambert conformal conic)
1000 Meters Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1983 North American datum
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
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Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the US Pacific Southwest Region
Landnet revised according to additional Forest Service evidence

SCALE 1:24,000
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

- | | |
|-----------------------------|-----------------------------|
| National Forest Boundary | Primary Highway |
| Secondary Highway | Improved Light Duty, Paved |
| Improved Light Duty, Gravel | Improved Light Duty, Dirt |
| Unimproved Dirt | Trail |
| Road, Location Approximate | Forest Road |
| Forest Trail | Trail, Location Approximate |
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- | | |
|-----------------------------|--------------------------------|
| Surveyed, Location Reliable | Surveyed, Location Approximate |
| Unsurveyed, Protraction | |

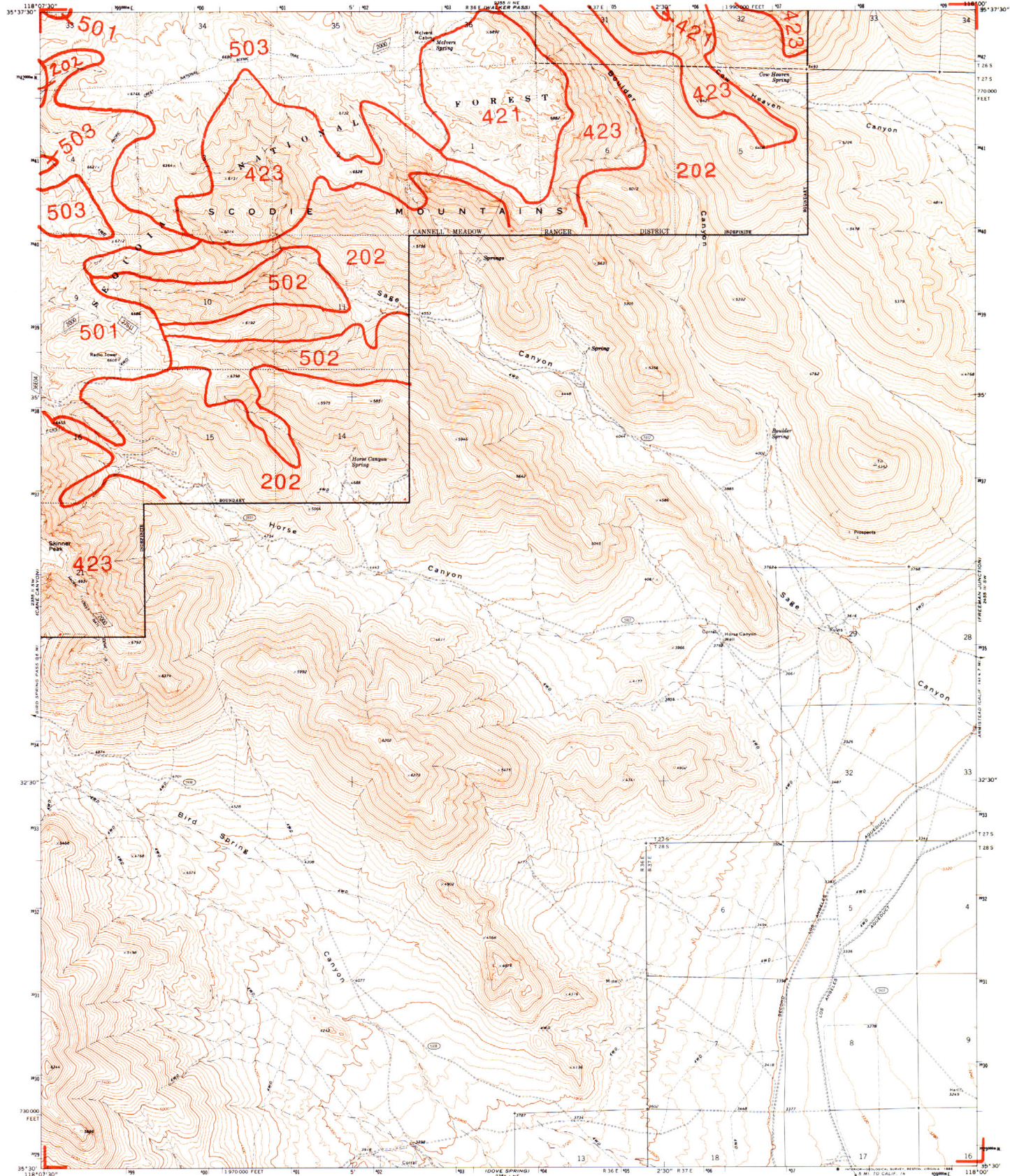


To place on the predicted North American datum 1983
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83 meters east as shown by dashed corner ticks

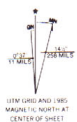
CANE CANYON, CALIF.
35116 F2-17-024

PHOTOREVISED 1985
259-3C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980



Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1971. Field checked 1972.
Projection and 10,000-foot grid ticks. California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum.
Fine red dashed lines indicate selected fence lines.
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985.
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the US Pacific Southwest Region.
Landnet revised according to additional Forest Service evidence.



Legend:
National Forest Boundary
Alienated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction

Legend:
Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate

Legend:
Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate

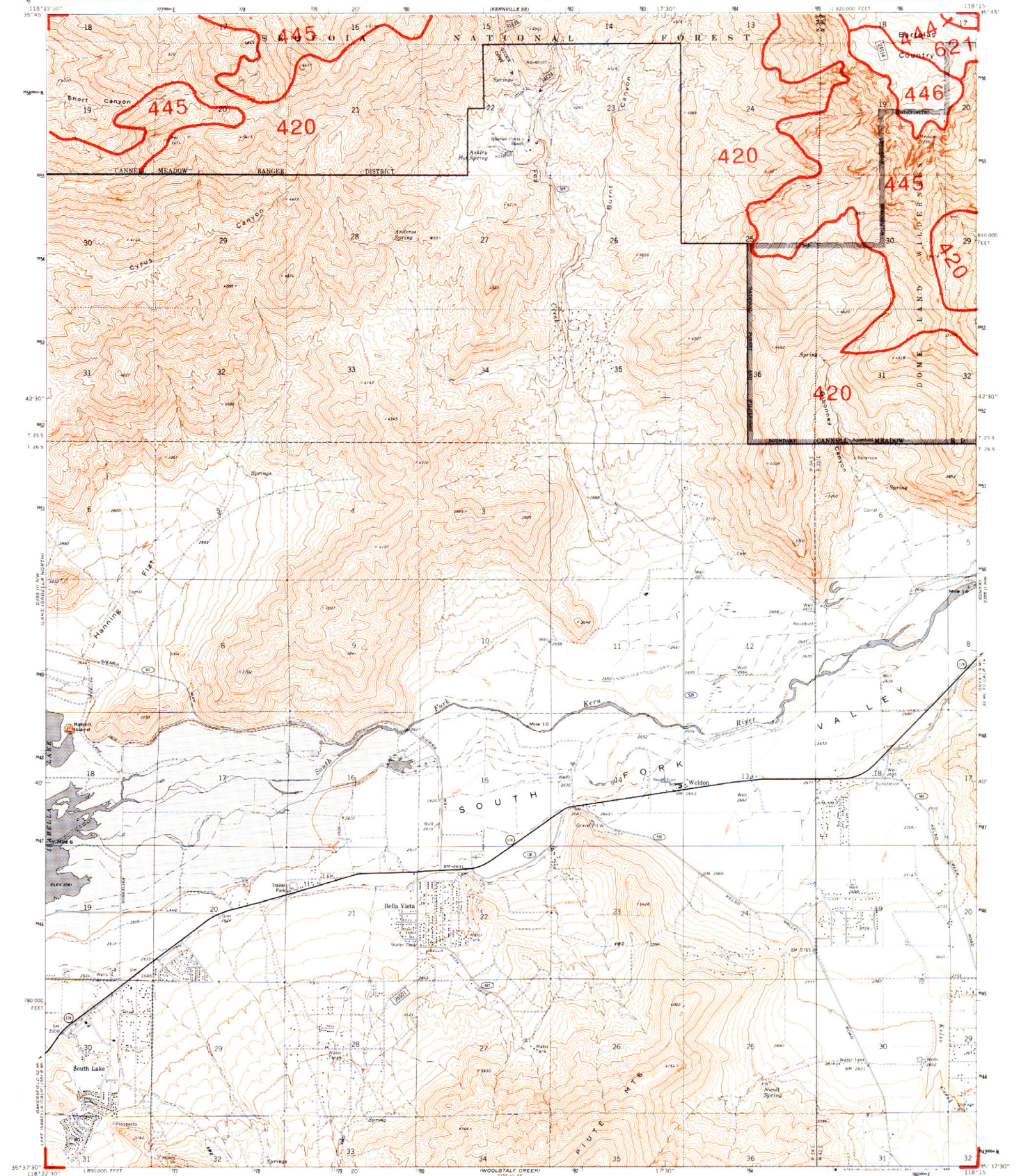


To place on the predicted North American datum 1983
move the projection lines 7 meters north and
83 meters east as shown by dashed corner ticks

HORSE CANYON, CALIF.
SE/4 ONLY 15' QUADRANGLE
30'18" E 11° 04'
REVISED 1985

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

WELDON QUADRANGLE
CALIFORNIA - KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE 1/4 SECTION 15 QUADRANGLE



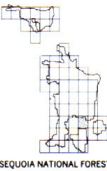
Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000-foot grid ticks. California coordinate
system, zone 9 (Lambert conformal conic)
1200 meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
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Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region
Landnet revised according to additional Forest Service evidence



SCALE 1:24,000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
NATIONAL GEODESIC VERTICAL DATUM OF 1929

- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- Surveyed, Location Reliable
- Surveyed, Location Approximate
- Unsurveyed, Protraction
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Road
- Forest Road
- Forest Trail
- Trail, Location Approximate



To place on the predicted North American datum 1983
move the projection lines 7 meters north and
84 meters east as shown by dashed corner ticks

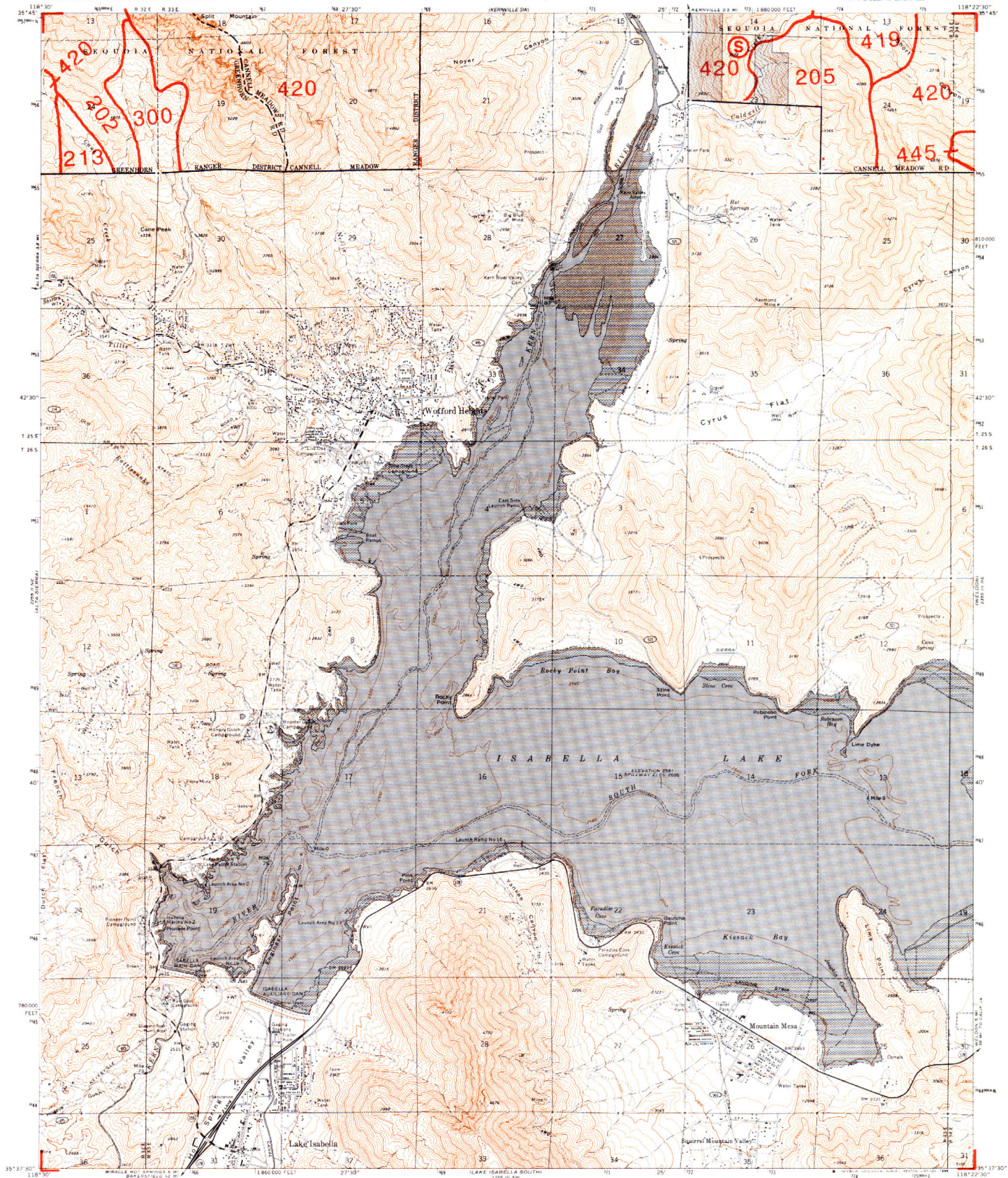
WELDON, CALIF.
NE 1/4 SECTION 15 QUADRANGLE
3518-F3-15-024

PHOTOREVISED 1985

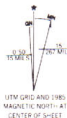
260-1C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

LAKE ISABELLA NORTH QUADRANGLE
CALIFORNIA-KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NW 4 ISABELLA 15 QUADRANGLE



Base map prepared by the U.S. Geological Survey
Control by USGS and NGS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Underwater contours by USGS
Projection and 10,000-foot grid ticks: California coordinate
System, zone 5 (Lambert conformal conic)
1000 meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Areas covered by dashed light blue pattern
are subject to controlled inundation
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



SCALE 1:24,000
CONTOUR INTERVAL 40 FEET
SUPPLEMENTARY CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
TOWNSHIP AND SECTION LINE CLASSIFICATION
— National Forest Boundary
— Alienated Land within the National Forest Boundary
— Surveyed, Location Reliable
— Surveyed, Location Approximate
— Unsurveyed, Protraction
— Primary Highway
— Secondary Highway
— Improved Light Duty, Paved
— Improved Light Duty, Gravel
— Unimproved Light Duty, Dirt
— Trail
— Road, Location Approximate

Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



To place on the predicted North American datum, 1983
move the projection lines 7 meters north and
84 meters east as shown by dashed corner ticks.

LAKE ISABELLA NORTH, CALIF.

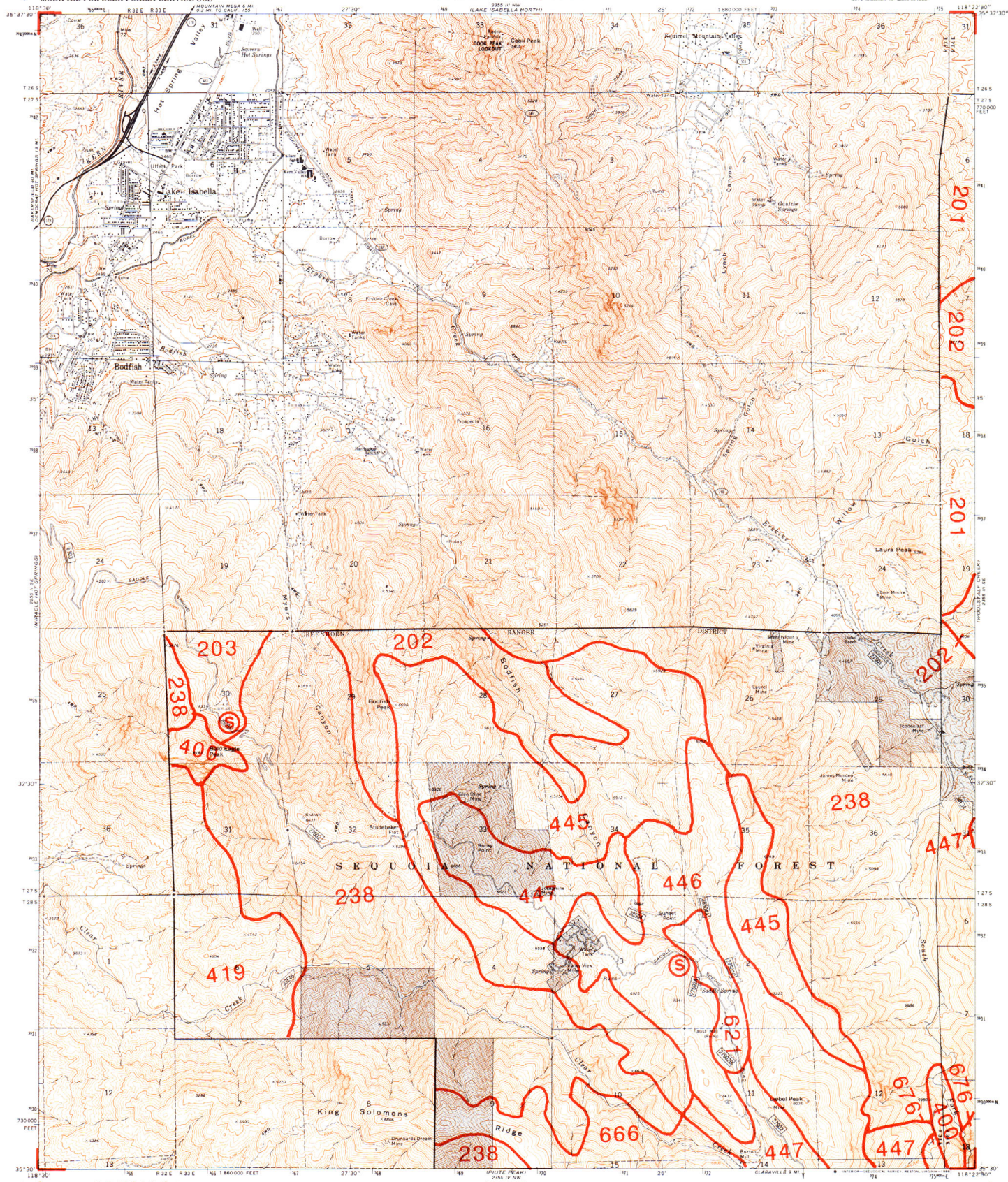
REVISED 1987

260-2C

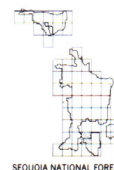
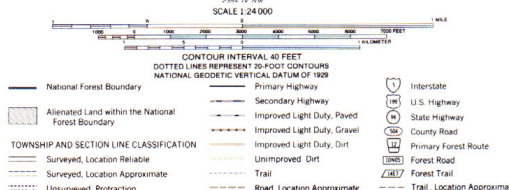
SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

LAKE ISABELLA SOUTH QUADRANGLE
CALIFORNIA-KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
BY LAKE ISABELLA 10 QUADRANGLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000 foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985
Fine red dashed lines indicate selected fence lines
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region
Landmark revised according to additional Forest Service evidence



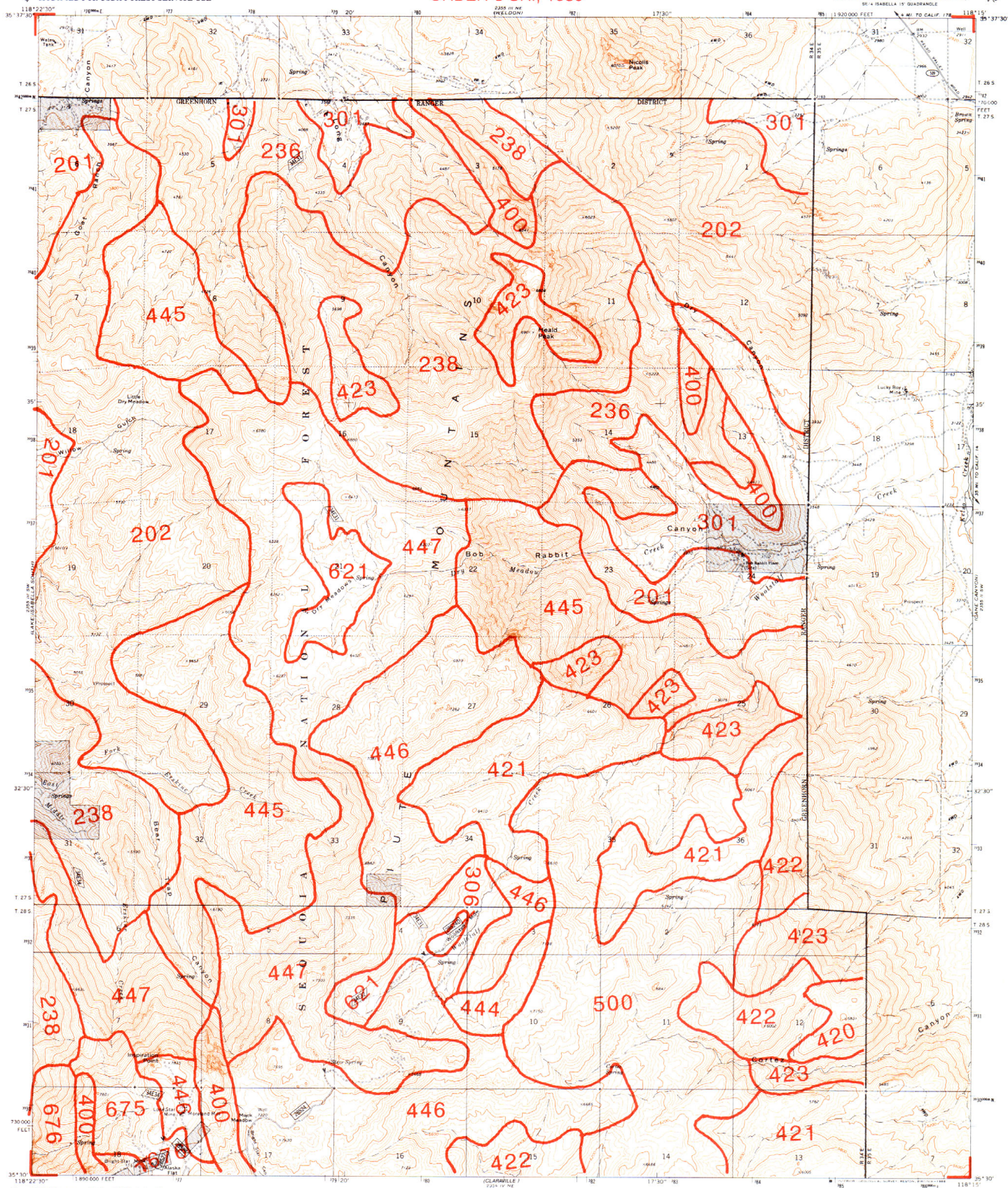
To place on the predicted North American datum 1983
move the projection lines 7 meters north and
84 meters east as shown by dashed corner ticks

LAKE ISABELLA SOUTH, CALIF.
BY LAKE ISABELLA 10 QUADRANGLE
35118-54 19-024
REVISED 1986
PHOTOREVISED 1985
DMA 2304 11 SW-58165 1985
260-3C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

WOOLSTALF CREEK QUADRANGLE
CALIFORNIA: KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE 4 ISABELLA 15 QUADRANGLE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial

photographs taken 1970. Field checked 1972

Projection and 10,000-foot grid ticks, California coordinate

System, zone 5 (Lambert conformal conic)

1000 meter Universal Transverse Mercator grid ticks,

zone 11, shown in blue. 1927 North American datum

Additional revisions by the U.S. Geological Survey from 1983

aerial photographs and other source data. Partial field check

by USDA Forest Service. Map edited 1985

Fine red dashed lines indicate selected fence lines

Modification to USGS base map by the Geomagnetic Survey from 1983

Center from 1983 and 1983 aerial photography and 1984

correction guides furnished by the FS Pacific Southwest Region

Landnet revised according to additional Forest Service evidence



SCALE 1:24,000

CONTOUR INTERVAL 40 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

- | | | |
|------------------------------------------------------|-------------------------------|-------------------------------|
| — National Forest Boundary | — Primary Highway | — Interstate |
| — Alienated Land within the National Forest Boundary | — Secondary Highway | — U.S. Highway |
| — Township and Section Line Classification | — Improved Light Duty, Paved | — State Highway |
| — Surveyed, Location Reliable | — Improved Light Duty, Gravel | — County Road |
| — Surveyed, Location Approximate | — Improved Light Duty, Dirt | — Primary Forest Road |
| — Unsurveyed, Protraction | — Unimproved Dirt | — Forest Road |
| | — Trail | — Forest Trail |
| | — Road, Location Approximate | — Trail, Location Approximate |



To place on the predicted North American datum 1983
move the projection lines 7 meters north and
84 meters east as shown by dashed corner ticks

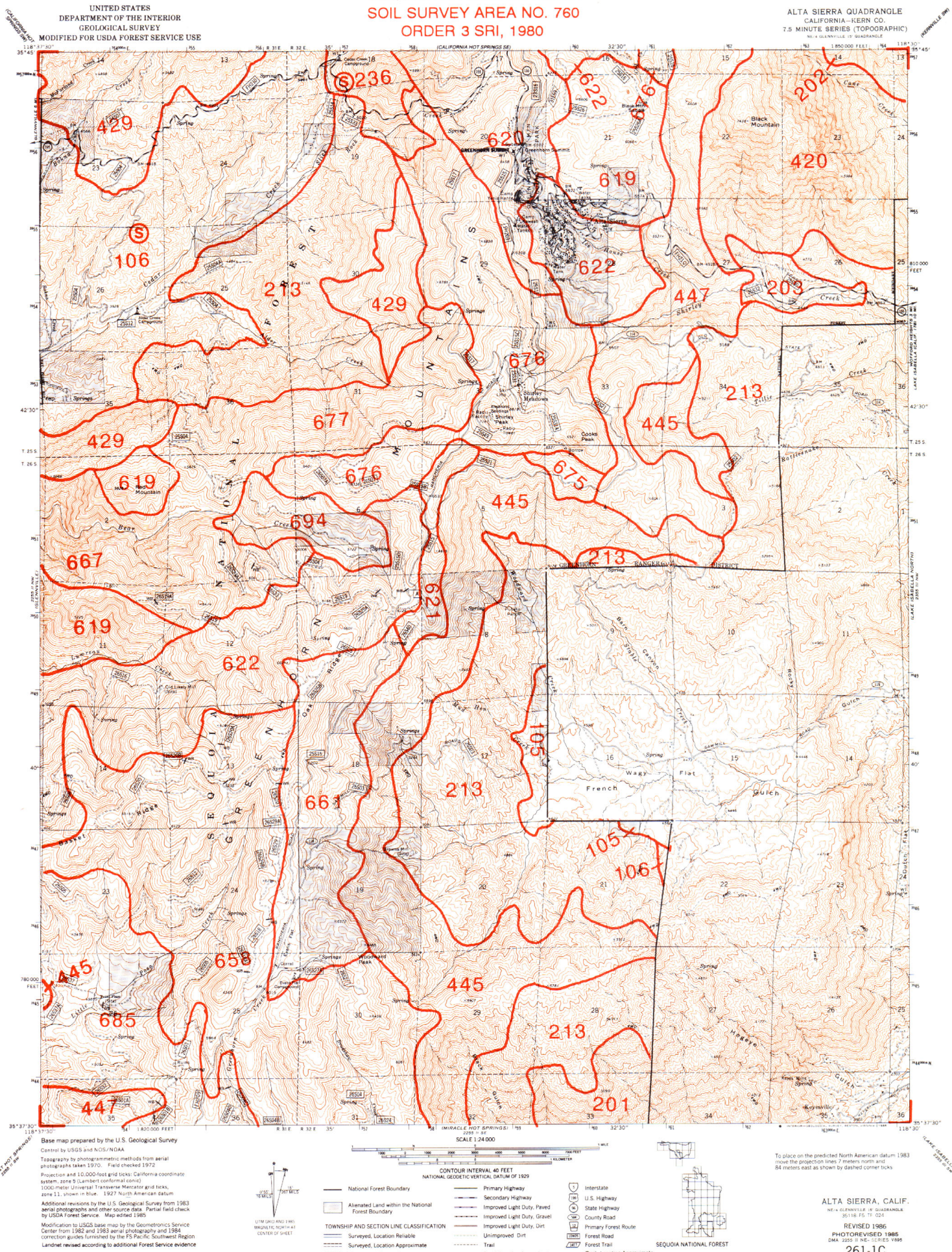
WOOLSTALF CREEK, CALIF.
SE 4 ISABELLA 15 QUADRANGLE
35118-03 TP 12A

PHOTOREVISED 1985

260-4C

ALTA SIERRA QUADRANGLE
CALIFORNIA—KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

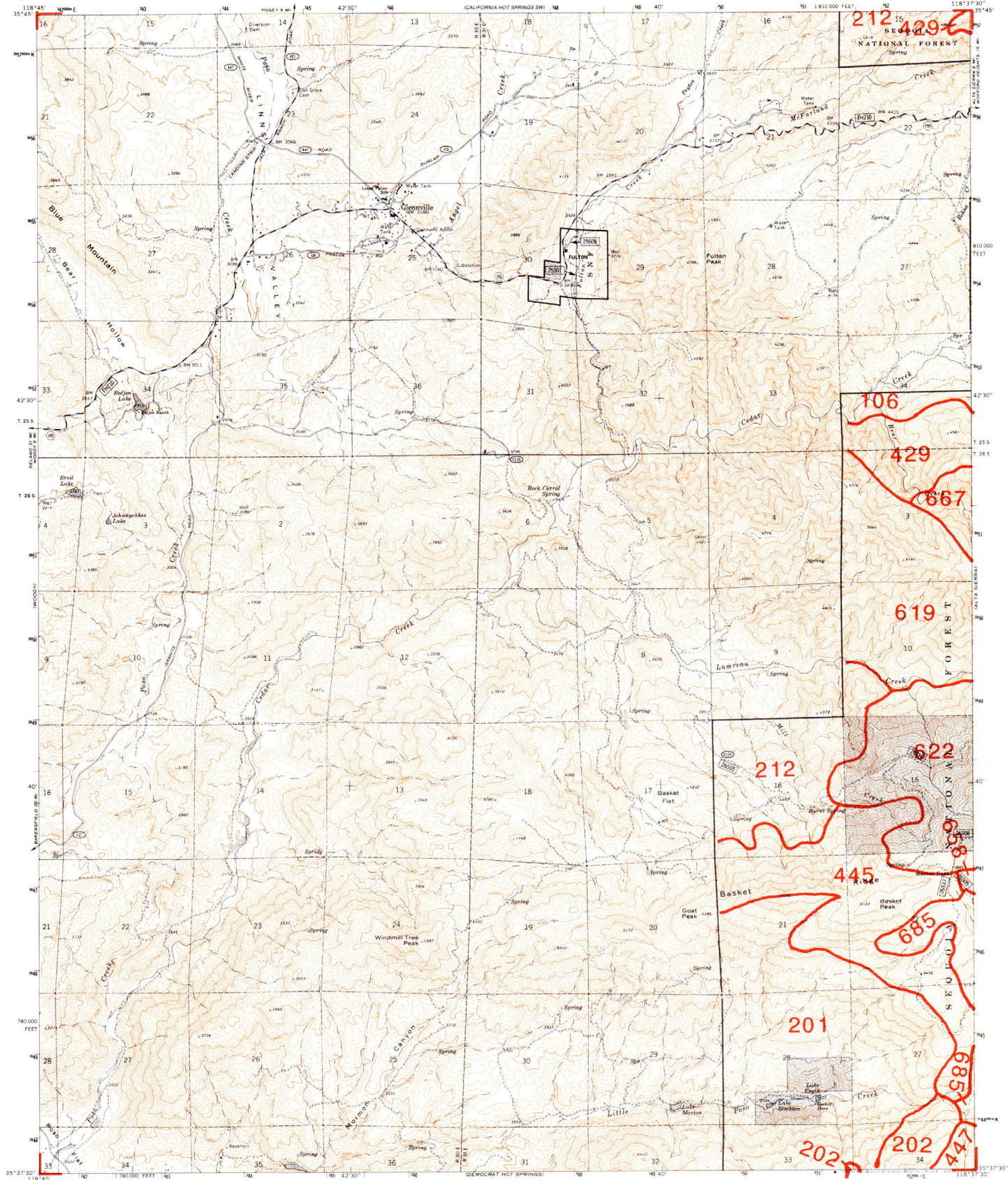
ALTA SIERRA QUADRANGLE
CALIFORNIA—KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



ALTA SIERRA, CALIF
NE 1/4 GLENVILLE 15' QUADRANGLE
35118 F5 TF 024
REVISED 1986
PHOTOREVISED 1985
DMA 2255 II NE-SERIES V895
261-1C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

GLENNVILLE QUADRANGLE
CALIFORNIA-KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NW 1/4 GLENNVILLE 15 QUADRANGLE



Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000 foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000 metre Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1927 North American datum
Fine red dashed lines indicate selected fence lines
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the U.S. Pacific Southwest Region



TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
— Surveyed, Location Approximate
- - - - - Unsurveyed, Protraction

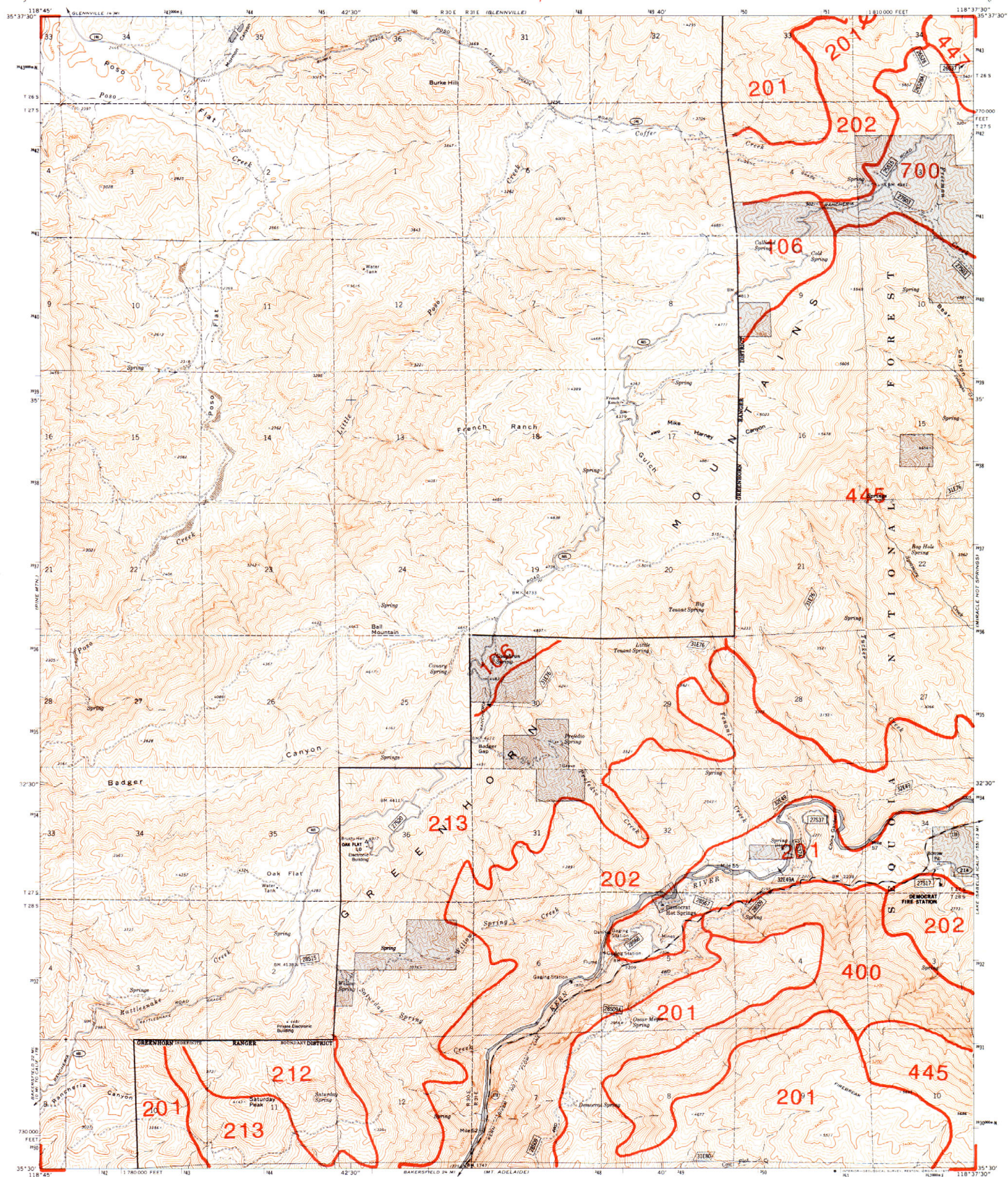
ROAD LOCATION APPROXIMATE
— Primary Highway
— Secondary Highway
— Improved Light Duty, Paved
— Improved Light Duty, Gravel
— Unimproved Dirt
— Trail
— Road, Location Approximate

FOREST TRAIL LOCATION APPROXIMATE
— Interstate
— U.S. Highway
— State Highway
— County Road
— Primary Forest Road
— Forest Road
— Forest Trail
— Trail, Location Approximate



GLENNVILLE, CALIF.
NW 1/4 GLENNVILLE 15 QUADRANGLE
N 35° 37' 30" W 118° 37' 30" E
REVISED 1985

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980



Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972.
Projection and 10,000-foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator and ticks,
zone 11, shown in blue. 1927 North American datum.
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region.



SCALE 1:24,000
NATIONAL GEODETIC VERTICAL DATUM OF 1929
CONTOUR INTERVAL 40 FEET

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36



SEQUOIA NATIONAL FOREST

DEMOCRAT HOT SPRINGS, CALIF.

REVISED 1986

261-3C



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

MIRACLE HOT SPRINGS QUADRANGLE
CALIFORNIA-KERN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
BY A. GLENVILLE, 1954

Base map prepared by the U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial
photographs taken 1970. Field checked 1972
Projection and 10,000-foot grid ticks: California coordinate
system, zone 5 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue. 1967 North American datum.
Additional revisions by the U.S. Geological Survey from 1983
aerial photographs and other source data. Partial field check
by USDA Forest Service. Map edited 1985
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region
Landmark revised according to additional Forest Service evidence



- Legend:
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Unimproved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate

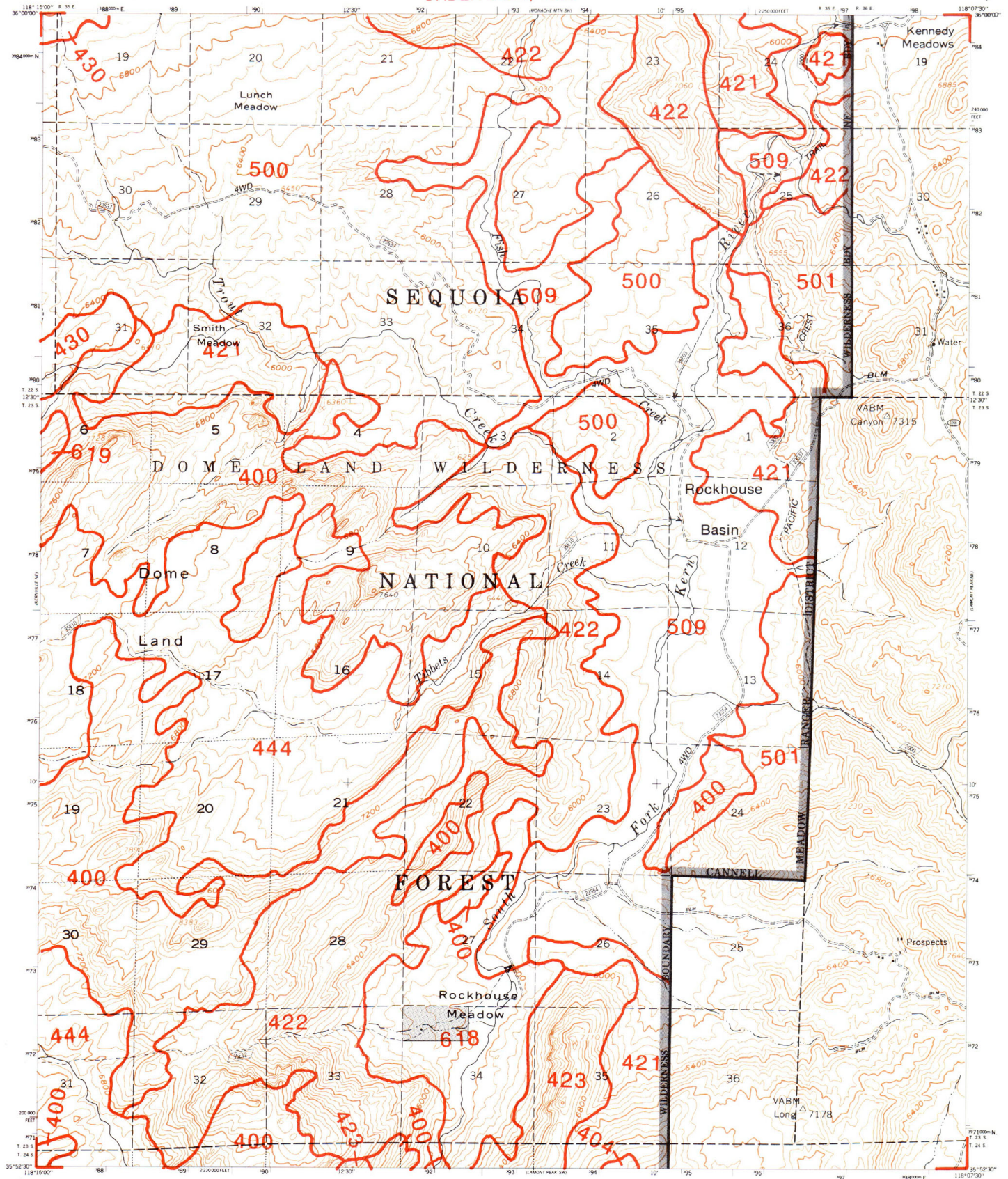
- Legend:
- Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Route
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate



MIRACLE HOT SPRINGS, CALIF.
56-A GLENVILLE 15 QUADRANGLE
25118-25-15-024
REVISED 1985
PHOTO-REVISED 1985
DMA 2555 II SE-SERIES 1985
261-4C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

LAMONT PEAK NW QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



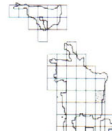
Base map prepared by the U.S. Geological Survey
Control by USGS and USCAGS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grids based on California coordinate system, zones 4 and 5
1000-meter Universal Transverse Mercator grid ticks, zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



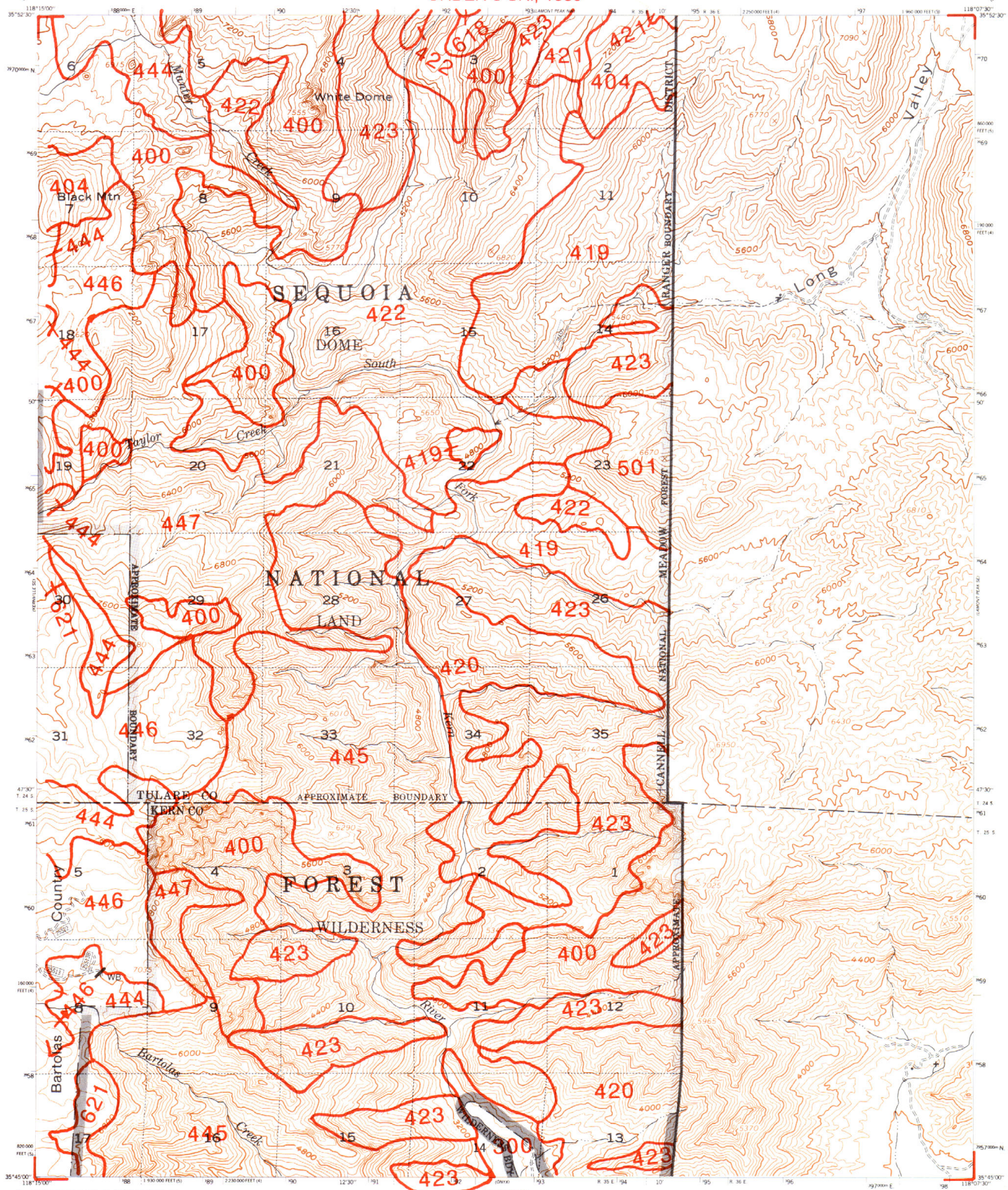
SCALE 1:24,000

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

- | | |
|------------------------------------------------------|-------------------------------|
| — National Forest Boundary | — Primary Highway |
| — Allocated Land within the National Forest Boundary | — Secondary Highway |
| — Township and Section Line Classification | — Improved Light Duty, Paved |
| — Surveyed, Location Reliable | — Improved Light Duty, Gravel |
| — Surveyed, Location Approximate | — Improved Light Duty, Dirt |
| — Unsurveyed, Protraction | — Unimproved Dirt |
| | — Trail |
| | — Road, Location Approximate |



SEQUOIA NATIONAL FOREST



Base map prepared by the U.S. Geological Survey
Control by USGS and USFWS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grids based on California coordinate system, zones 4 and 5
1000-meter Universal Transverse Mercator grid ticks.
Zone 11.
Unchecked elevations are shown in gray
INTERMEDIATE EDITION.
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

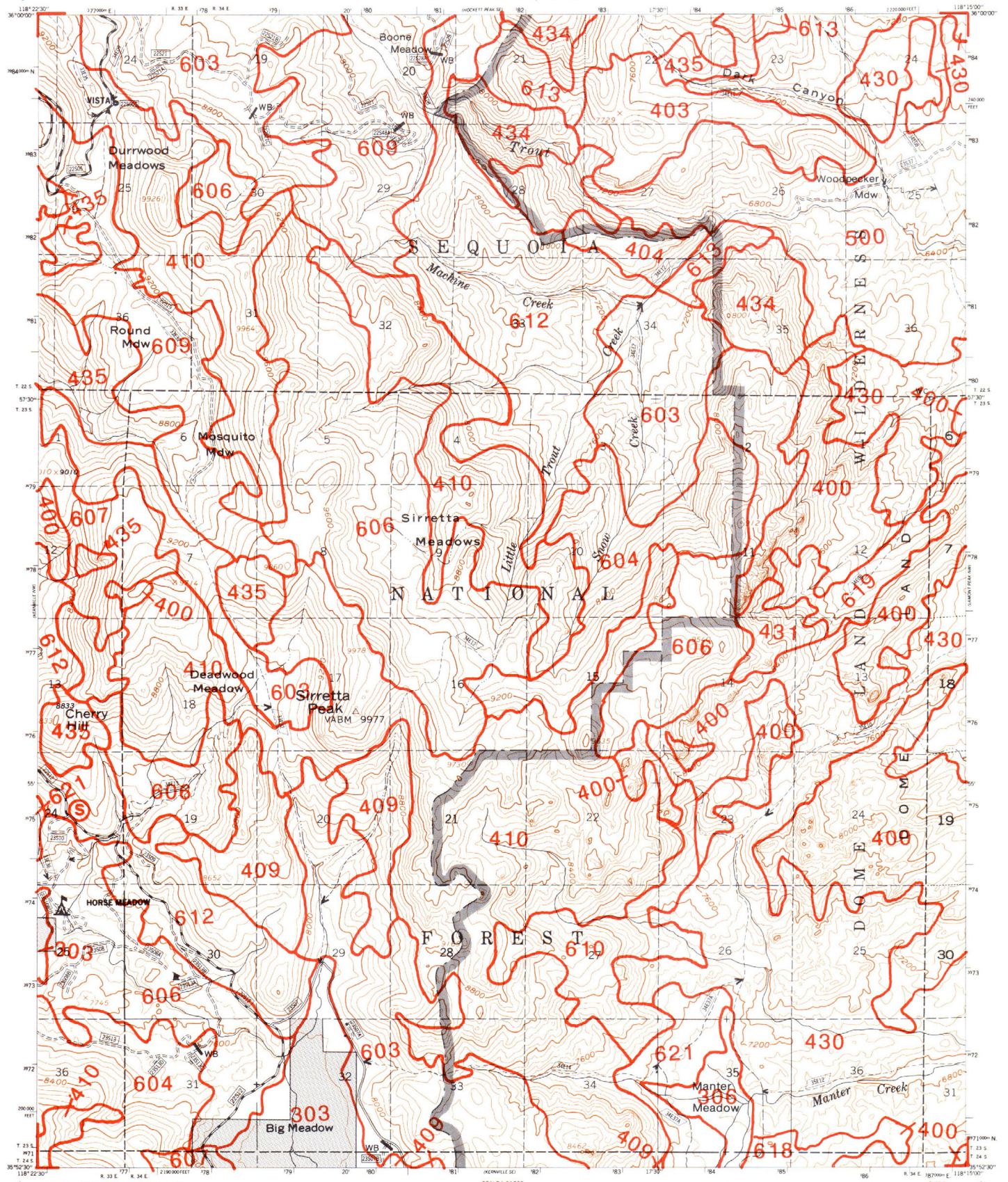


- | | | |
|----------------------------------------------------|-----------------------------|-----------------------------|
| National Forest Boundary | Primary Highway | Interstate |
| Alienated Land within the National Forest Boundary | Secondary Highway | U.S. Highway |
| TOWNSHIP AND SECTION LINE CLASSIFICATION | Improved Light Duty, Paved | County Road |
| Surveyed, Location Reliable | Improved Light Duty, Gravel | Primary Forest Road |
| Surveyed, Location Approximate | Improved Light Duty, Dirt | Forest Road |
| Unsurveyed, Location Approximate | Unimproved Dirt | Forest Trail |
| Unsurveyed, Protraction | Trail | Trail, Location Approximate |
| | Road, Location Approximate | |



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

KERNVILLE NE QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



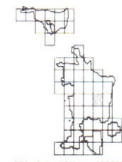
Base map prepared by the U.S. Geological Survey
Control by USGS and USCAGS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zones 4 and 5
1,000-meter Universal Transverse Mercator grid ticks,
zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomorphics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



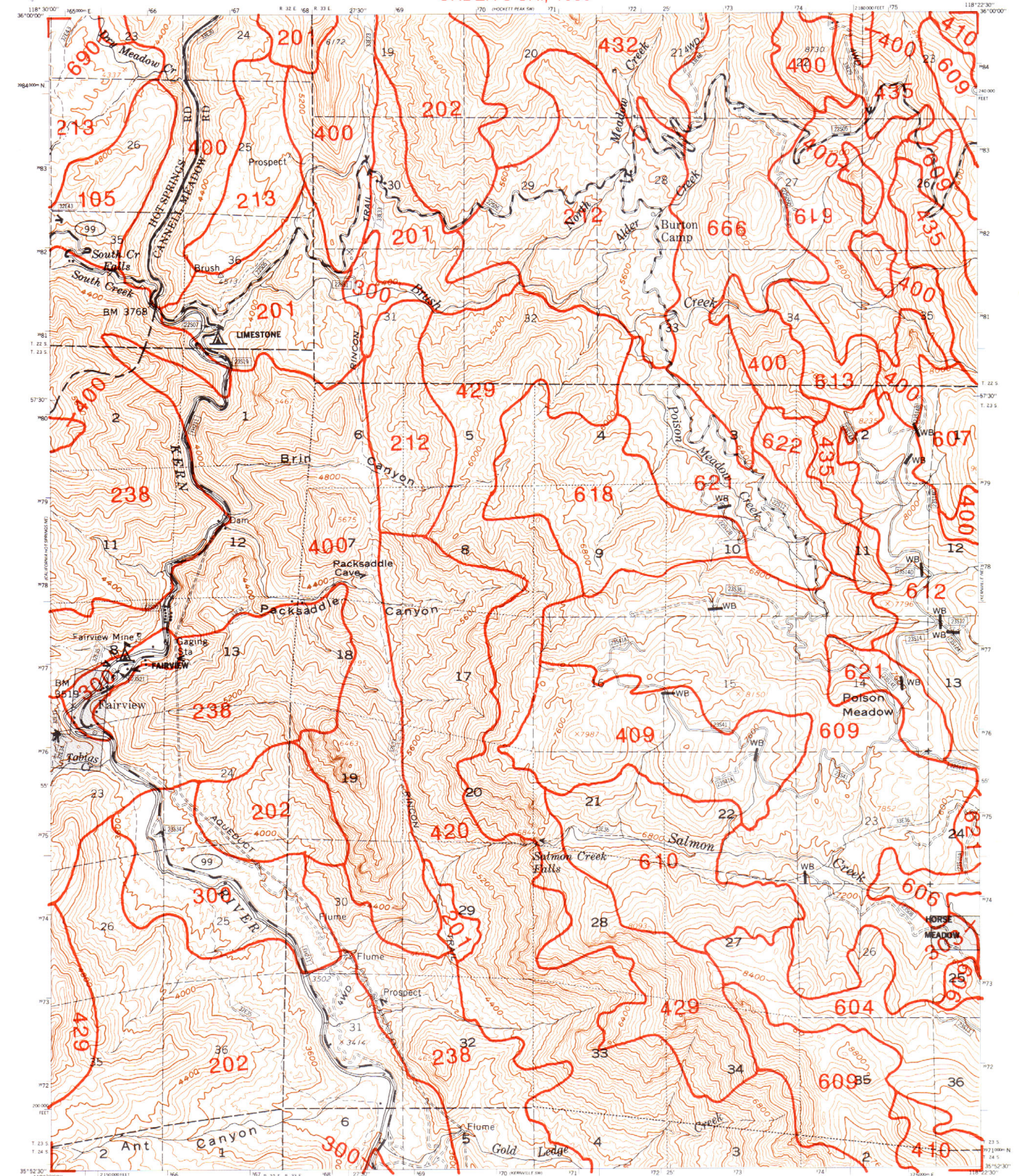
National Forest Boundary
Alienated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction

Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate

Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



PRIMARY BASE SERIES MAP
KERNVILLE N.E.
CALIFORNIA
N3552.5-W11815.7.5
REVISED 1987
284-1C



Base map prepared by the U.S. Geological Survey
Control by USGS and USACGS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000 foot grids based on California coordinate system, zones 4 and 5
1,000 meter Universal Transverse Mercator grid ticks, zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1965 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

SCALE 1:24,000

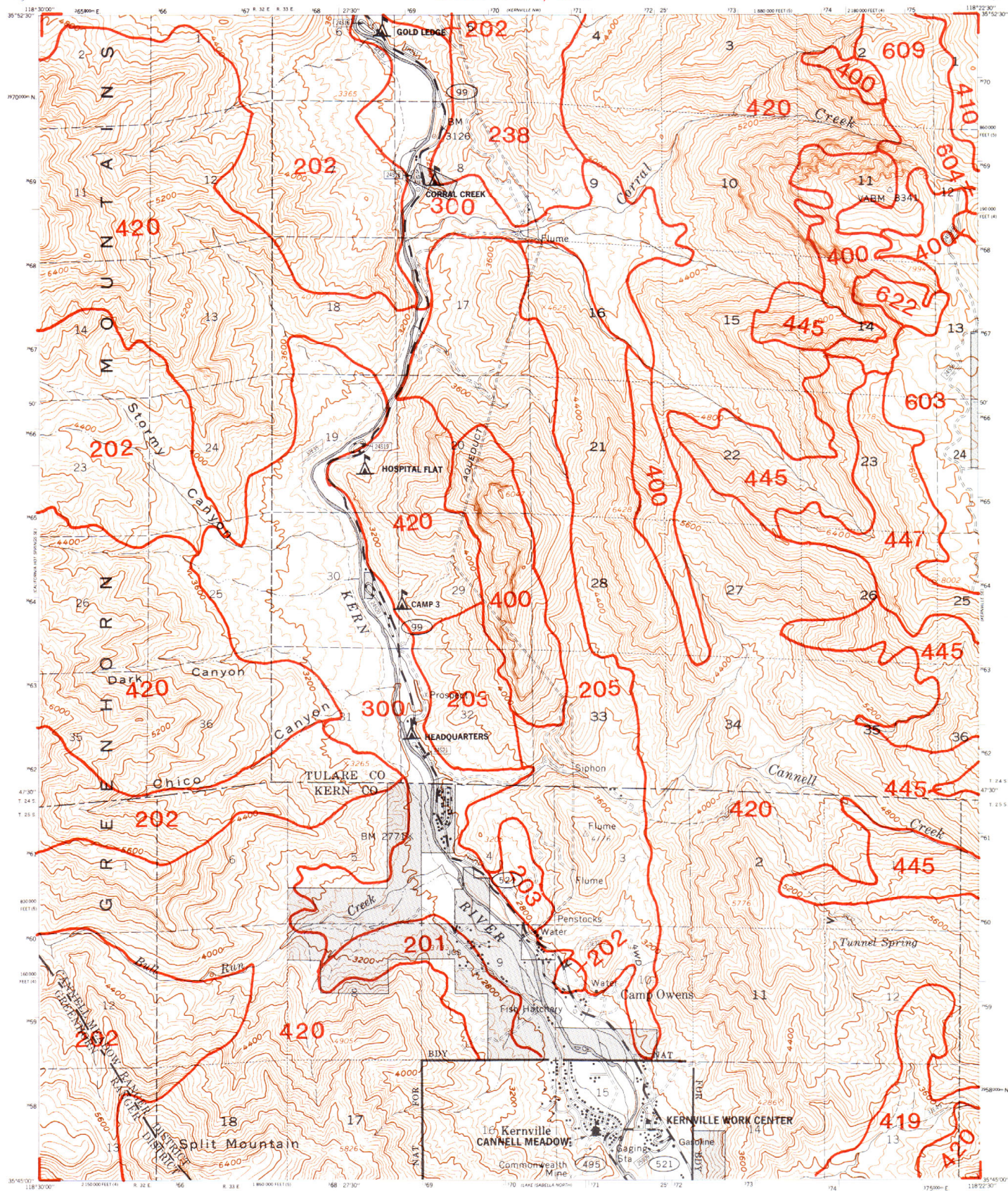
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Legend:

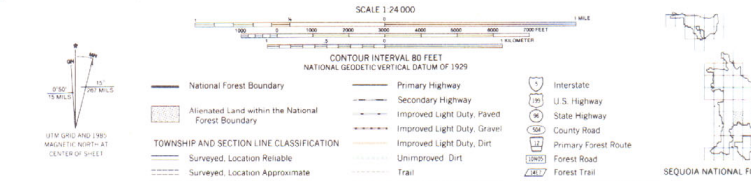
- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Road
- Forest Road
- Forest Trail
- Trail, Location Approximate

SEQUOIA NATIONAL FOREST

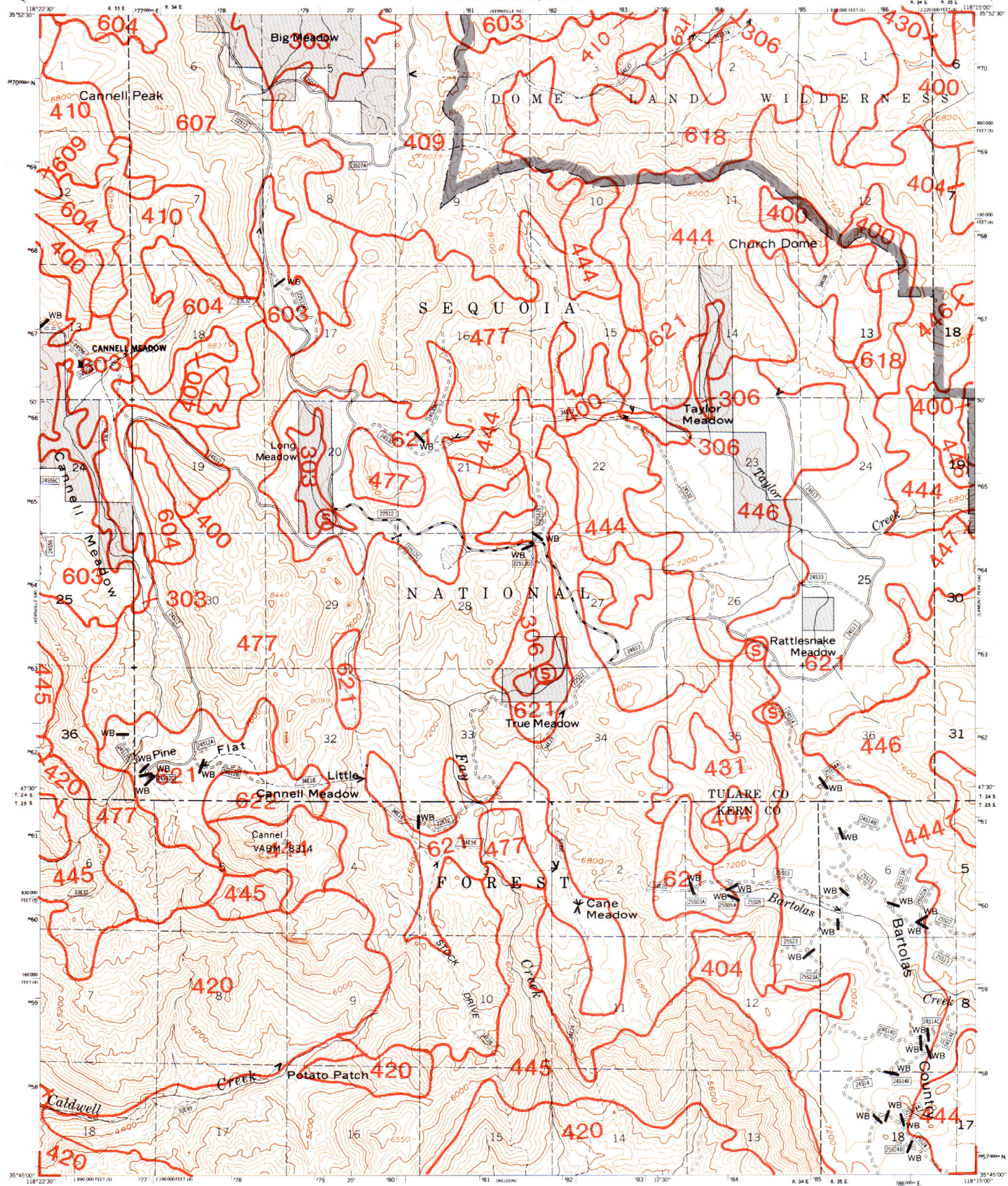
PRIMARY BASE SERIES MAP
KERNVILLE N.W., CALIFORNIA
N4552.5-W11822.5/7.5
REVISED 1987
284-2C



Base map prepared by the U.S. Geological Survey
Control by USGS and USCGS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955 - Advance field check 1956
Polyconic projection 1927 North American datum
10,000-foot grid based on California coordinate system, zones 4 and 5
1000-meter Universal Transverse Mercator grid ticks, zone 11
Unchecked elevations are shown in gray
Modification to USGS base map by the Geomatrix Service Center from 1962 and 1983 aerial photography and 1984 correction guides furnished by the FS Pacific Southwest Region
INTERMEDIATE EDITION



SEQUOIA NATIONAL FOREST
PRIMARY BASE SERIES MAP
KERNVILLE S.W., CALIFORNIA
N3545-W1822 S/7.5
REVISED 1986
284-3C



Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grids based on California coordinate system, zones 4 and 5
1000-meter Universal Transverse Mercator grid ticks, zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

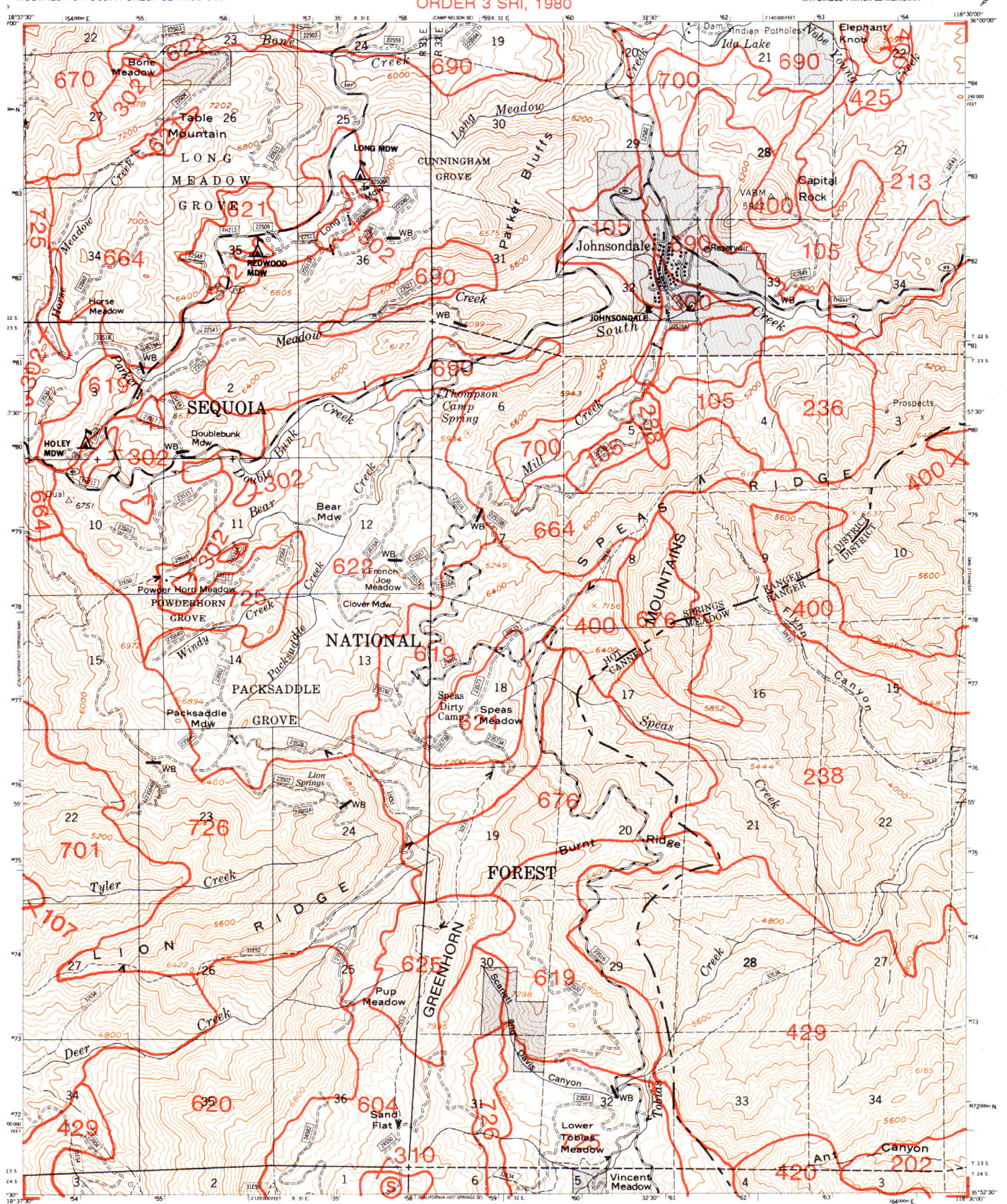


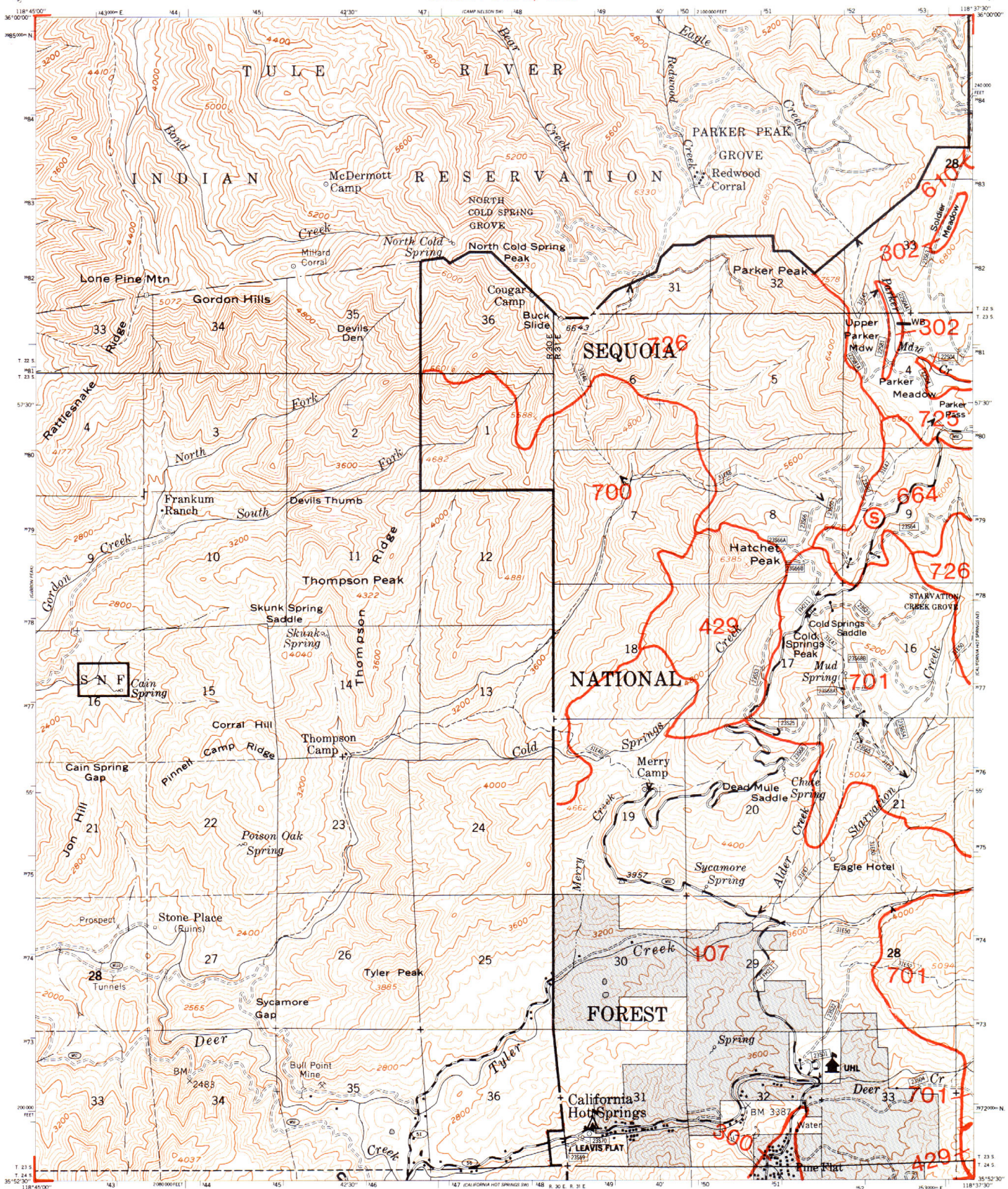
SCALE 1:24,000
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

| TOWNSHIP AND SECTION LINE CLASSIFICATION | ROAD CLASSIFICATION | TRAIL CLASSIFICATION |
|----------------------------------------------------|-----------------------------|-----------------------------|
| National Forest Boundary | Primary Highway | Interstate |
| Alienated Land within the National Forest Boundary | Secondary Highway | U.S. Highway |
| Surveyed, Location Reliable | Improved Light Duty, Paved | State Highway |
| Surveyed, Location Approximate | Improved Light Duty, Gravel | County Road |
| Unsurveyed, Protraction | Improved Light Duty, Dirt | Primary Forest Road |
| | Unimproved, Dirt | Forest Road |
| | Trail | Forest Trail |
| | Road, Location Approximate | Trail, Location Approximate |



PRIMARY BASE SERIES MAP
KERNVILLE S.E.
CALIFORNIA
N3545-W1815/7.5
REVISED 1987
284-4C





Base map prepared by the U.S. Geological Survey

Control by USGS, USACGS, and USFS

Topography from aerial photographs by multiple methods

Aerial photographs taken 1954. Field check 1958

Photocopy projection, 1927 North American datum

10,000-foot grid based on California coordinate system, zones 4 and 5

1000-meter Universal Transverse Mercator grid ticks, zone 11

Unchecked elevations are shown in gray

INTERMEDIATE EDITION

Modification to USGS base map by the Geomatrix Service

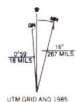
Center from 1982 and 1983 aerial photography and 1984

correction guides furnished by the FS Pacific Southwest Region

UTM GRID AND 1983 MAGNETIC NORTH AT CENTER OF SHEET

SCALE 1:24,000

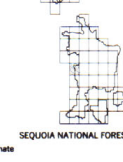
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL



- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate

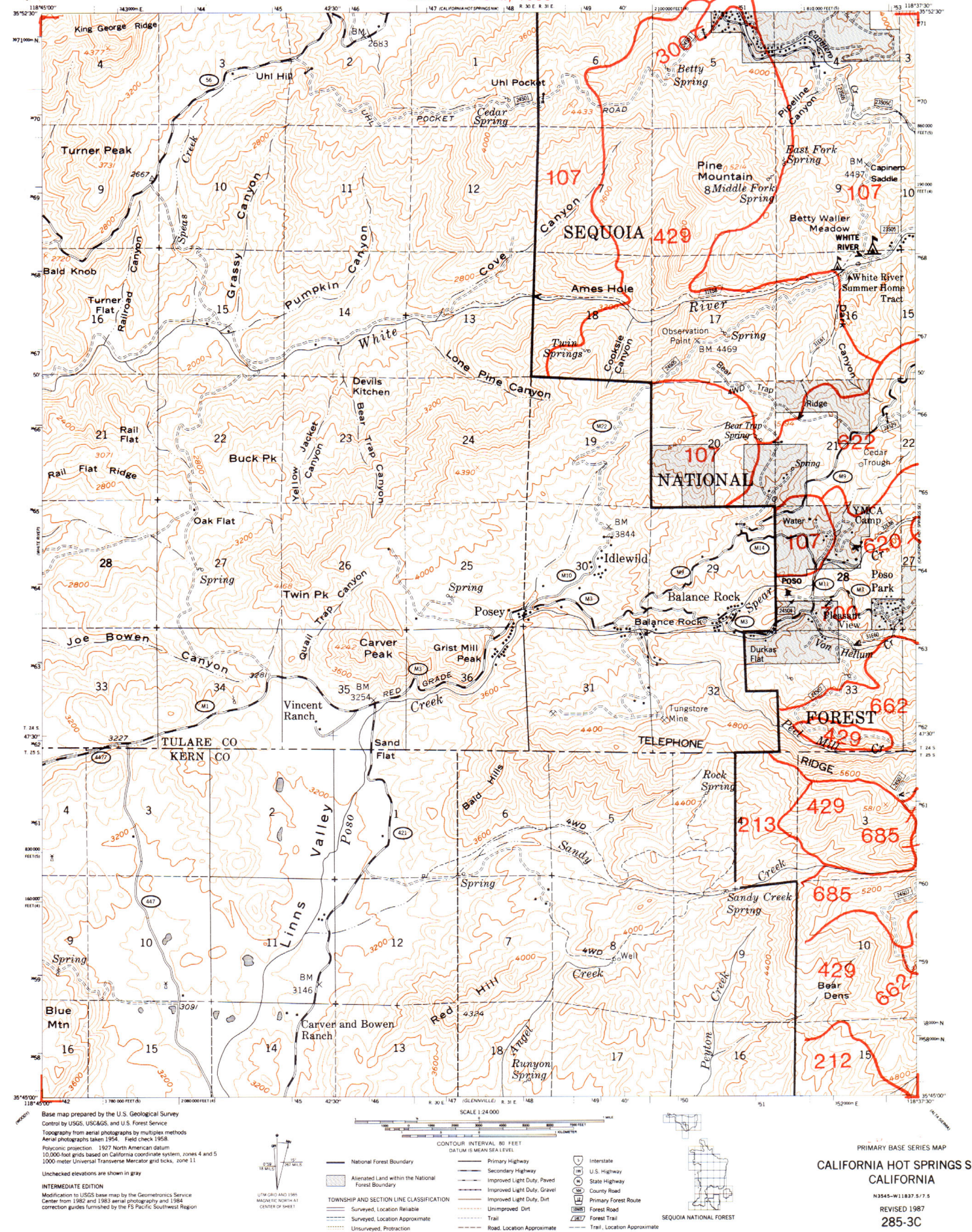


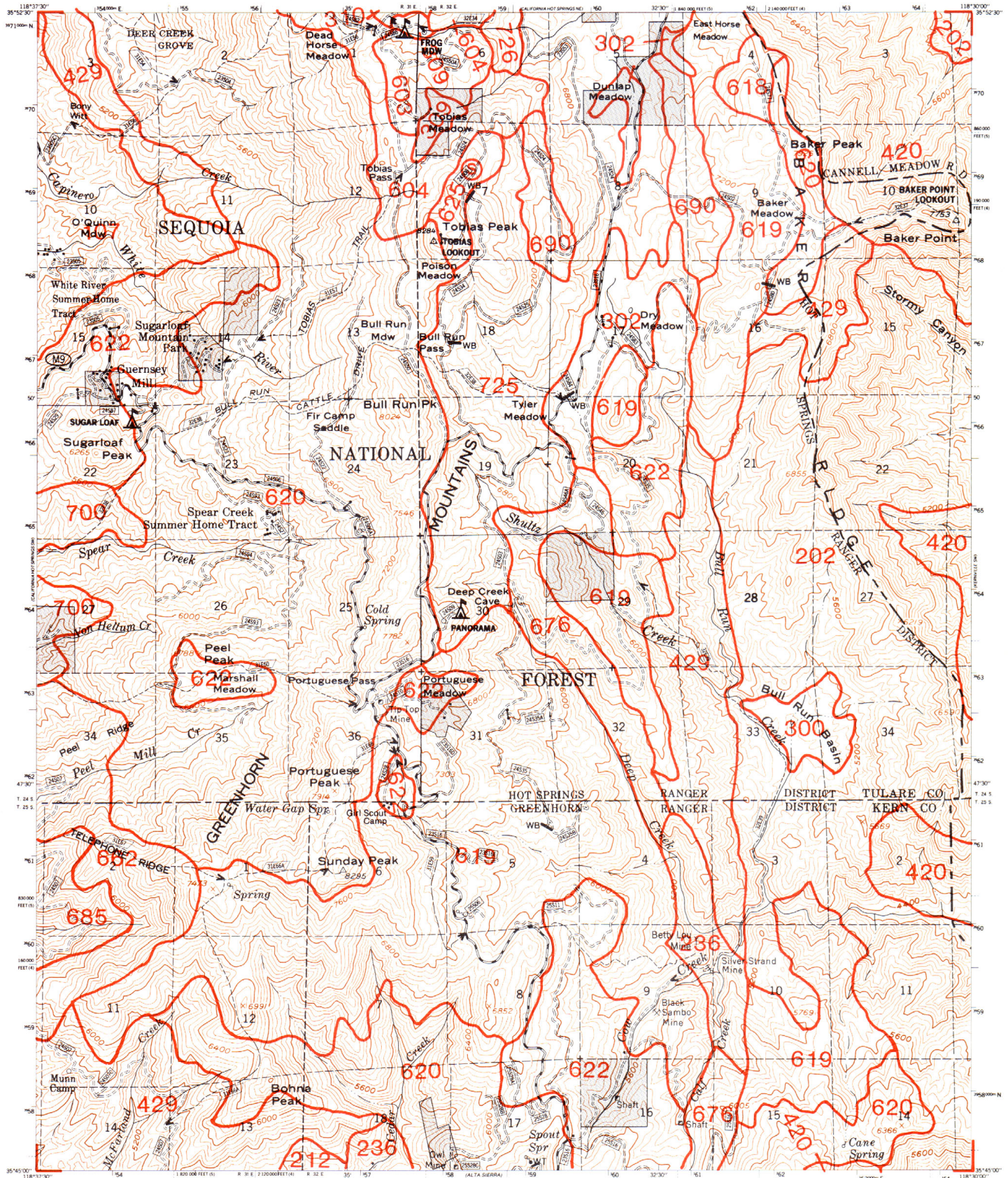
PRIMARY BASE SERIES MAP

CALIFORNIA HOT SPRINGS N.
CALIFORNIA

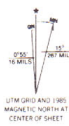
N 3552 S-W 11832 S 7.5

REVISED 1987
285-2C





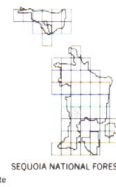
Base map prepared by the U.S. Geological Survey
Control by USGS, USCGS, and USFS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Field check 1958
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zones 4 and 5
1000-meter Universal Transverse Mercator grid ticks, zone 11
INTERMEDIATE EDITION
Modification to 1982 base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
--- Surveyed, Location Approximate
..... Unsurveyed, Protraction

CONTOUR INTERVAL: 80 FEET
(DATUM IN MEAN SEA LEVEL)
SCALE 1:24,000
— National Forest Boundary
— Alienated Land within the National Forest Boundary
— Primary Highway
— Secondary Highway
— Improved Light Duty, Paved
— Improved Light Duty, Gravel
— Improved Light Duty, Dirt
— Unimproved Dirt
— Trail
— Road, Location Approximate

— Interstate
— U.S. Highway
— State Highway
— County Road
— Primary Forest Route
— Forest Road
— Forest Trail
— Trail, Location Approximate



PRIMARY BASE SERIES MAP

CALIFORNIA HOT SPRINGS S.F.
CALIFORNIA

N 3545-W 11830/7.5

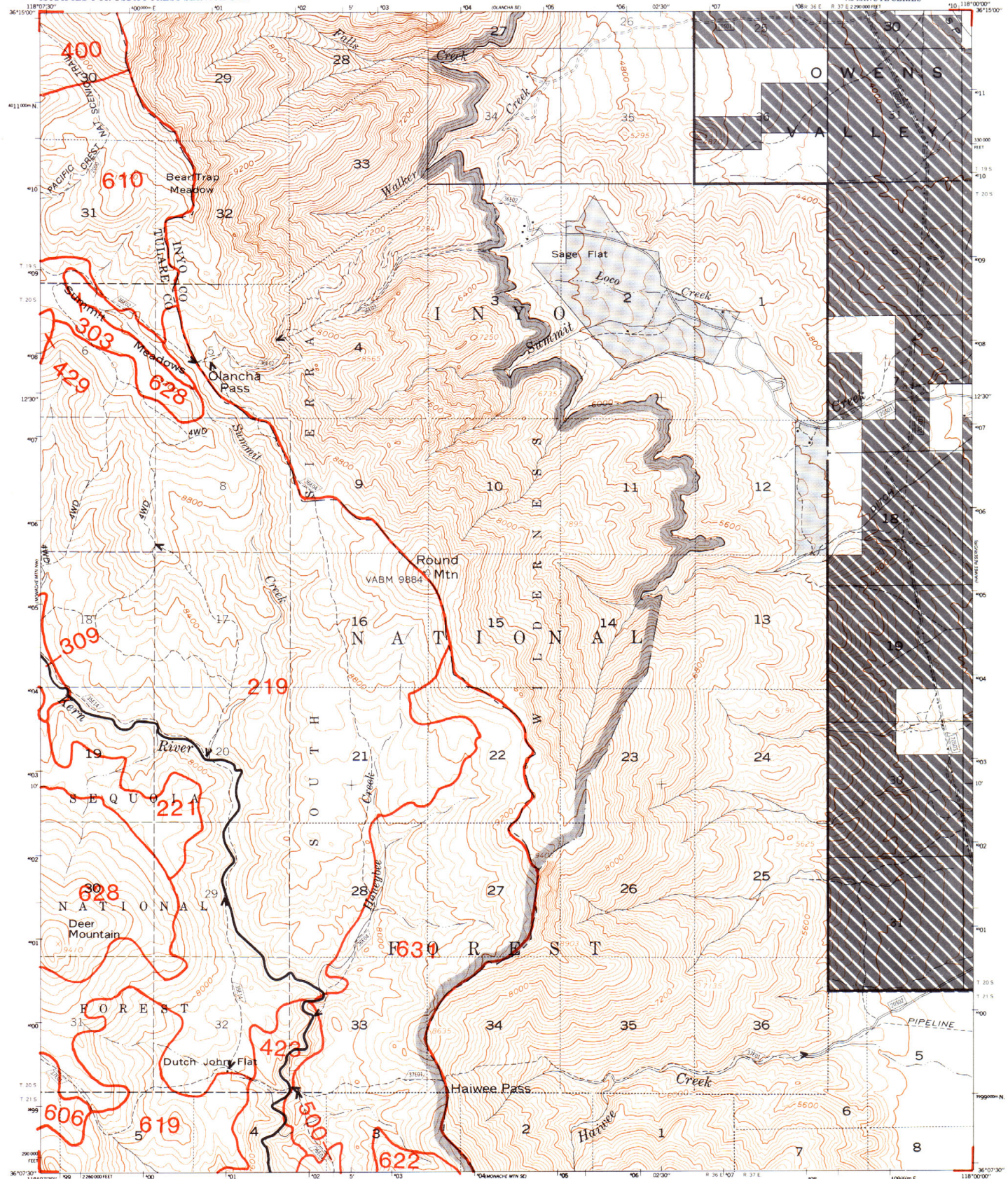
285-4C

REVISED 1987

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

MONACHE MTN NE QUADRANGLE
CALIFORNIA - INYO AND TULARE COUNTIES
MT. DIABLO PRINCIPLE MERIDIAN
7.5 MINUTE SERIES

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1976
Polyconic projection, 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
1000-metre Universal Transverse Mercator grid ticks zone 11

INTERIM EDITION
Photorevised by the Geomatics Service Center in 1984
from USGS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region

UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24,000
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

LEGEND

| | | |
|--------------------------------------------------------|-----------------------|----------------------------------------|
| — National Forest Boundary | — Primary Highway | — US Highway |
| — Alienated Land within the Forest Boundary as of 1984 | — Secondary Highway | — State Highway |
| — Township and Section Line Classification | — Improved Light Duty | — County Road |
| — Surveyed, Location Reliable | — Unimproved Dirt | — Forest Highway |
| — Surveyed, Location Approximate | — Trail | — Forest Road |
| — Unsurveyed, Protraction | — Locked Gate | — Forest Trail |
| — Unsurveyed, Location Approximate | — Barrier | — Forest Service Trail location approx |
| — Unsurveyed, Location Approximate | — Railroad | — Forest Service Road location approx |
| — Unsurveyed, Location Approximate | — Withdrawn BLM Land | |

Landnet (revised according to additional Forest Service evidence)

City of Los Angeles Land

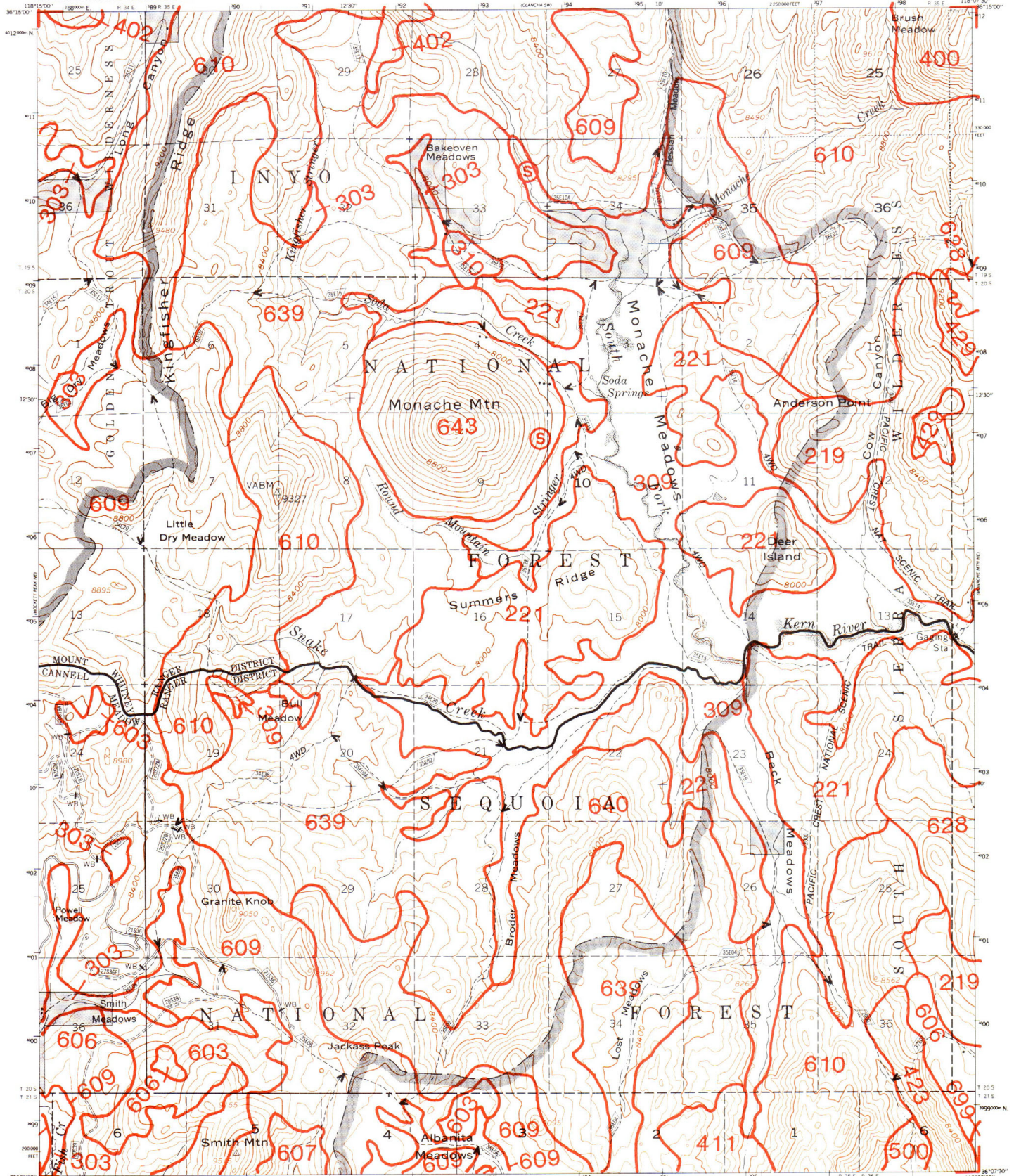
INYO NATIONAL FOREST

MONACHE MTN NE, CALIF
N3607.5-W118007.5
(306-1C)
REVISED 1984

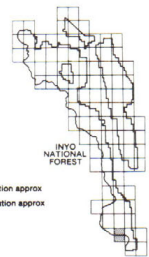
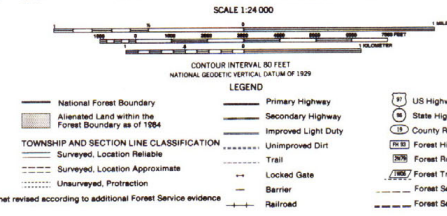
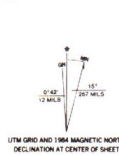
SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

MONACHE MTN NW QUADRANGLE
CALIFORNIA - TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN
7.5 MINUTE SERIES

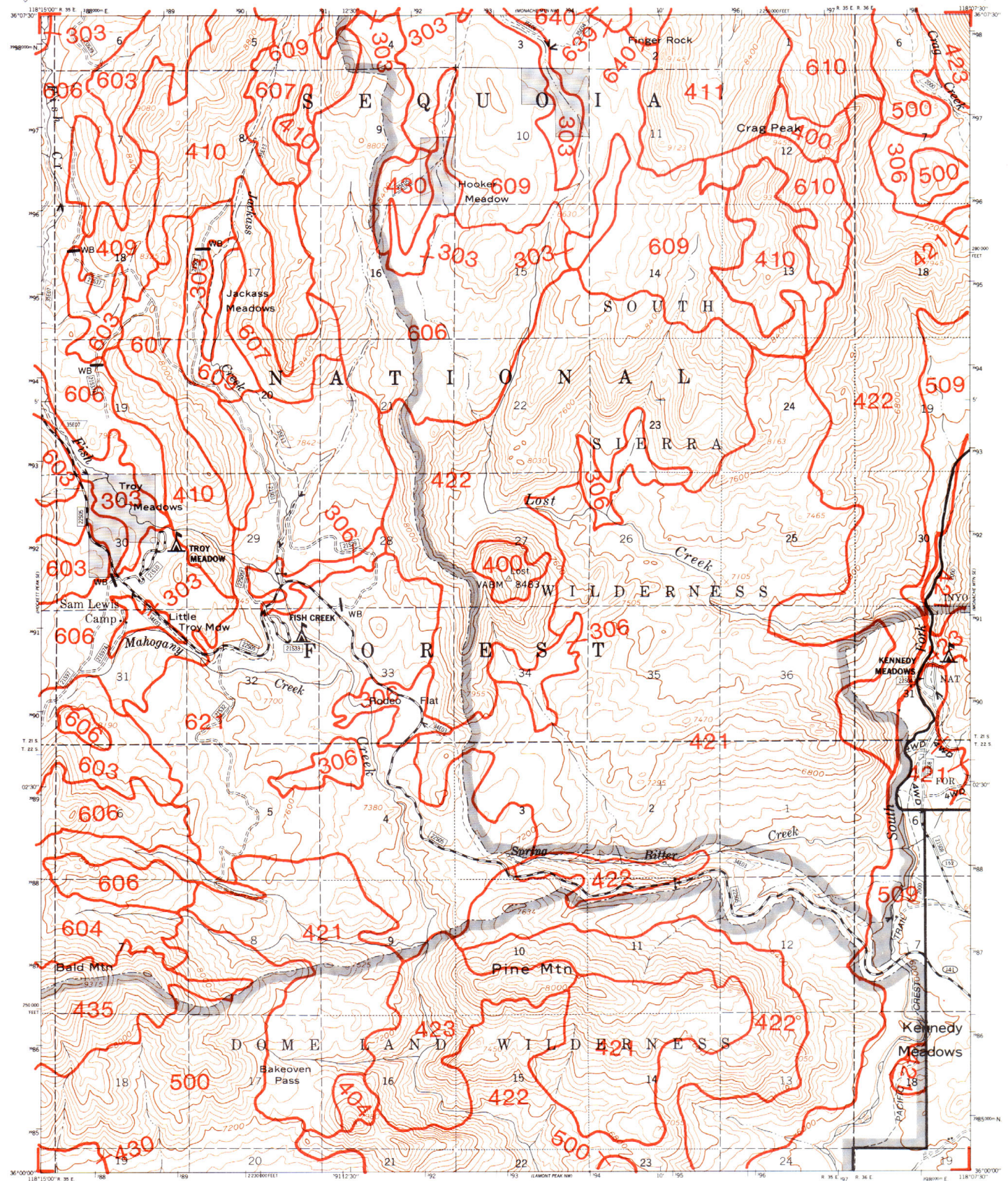
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1976
Polyconic projection, 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
1000-meter Universal Transverse Mercator and ticks zone 11
INTERIM EDITION
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



MONACHE MTN NW, CALIF.
N3607.5-W11807.5
1917
(306-2C)
REVISED 1984



Base map prepared by the U.S. Geological Survey
Control by USGS, USCAGS, and City of Los Angeles
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1954 and 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks, zone 11
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



National Forest Boundary
Alienated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction

CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate

Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate

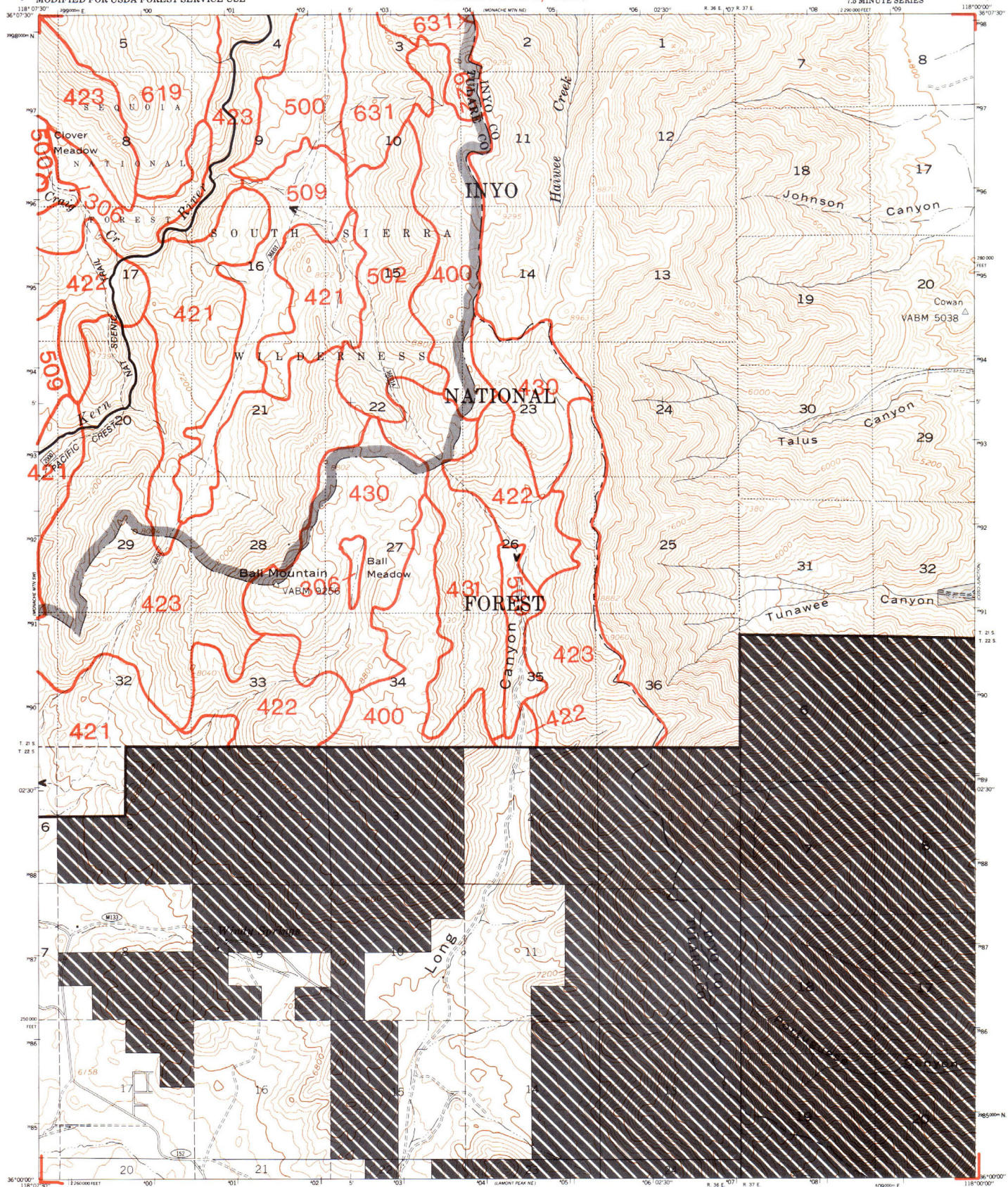


SEQUOIA NATIONAL FOREST

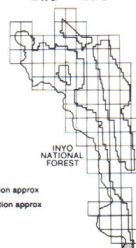
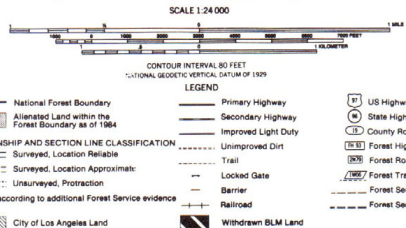
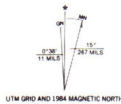
PRIMARY BASE SERIES MAP
MONACHE MTN. S.W.
CALIFORNIA

N 3600-W 11807.5/7.5

REVISED 1987
306-3C

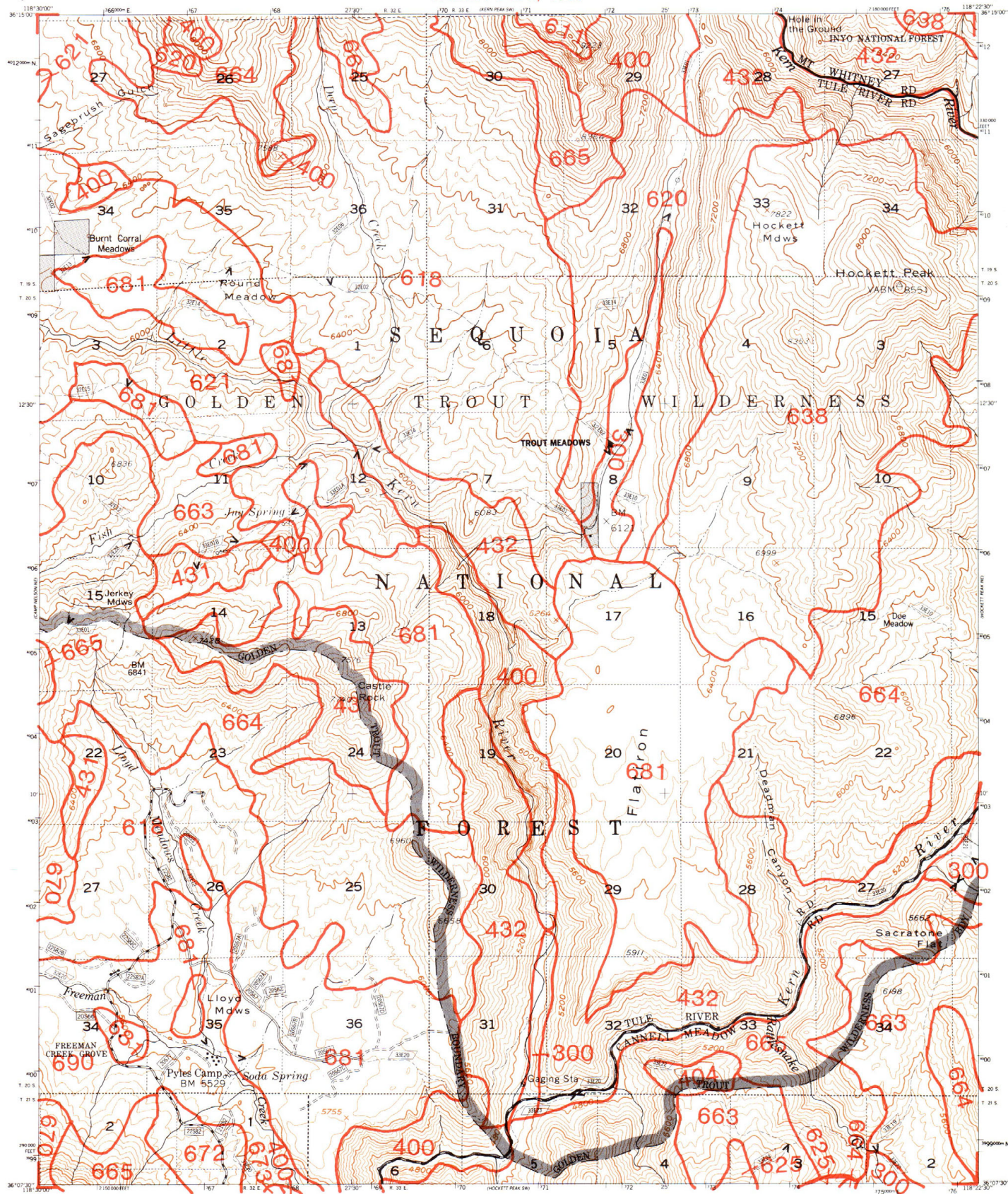


Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1976
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system zone 4
1000 metre Universal Transverse Mercator grid ticks zone 11
INTERIM EDITION
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



MONACHE MTN SE, CALIF
N3980-W11800-7.5
1977
(306-4C)
REVISED 1984





Base map prepared by the U.S. Geological Survey
Control by USGS, USCGS, and USFS

Topography from aerial photography by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1953-1955. Field check 1956
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 11

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

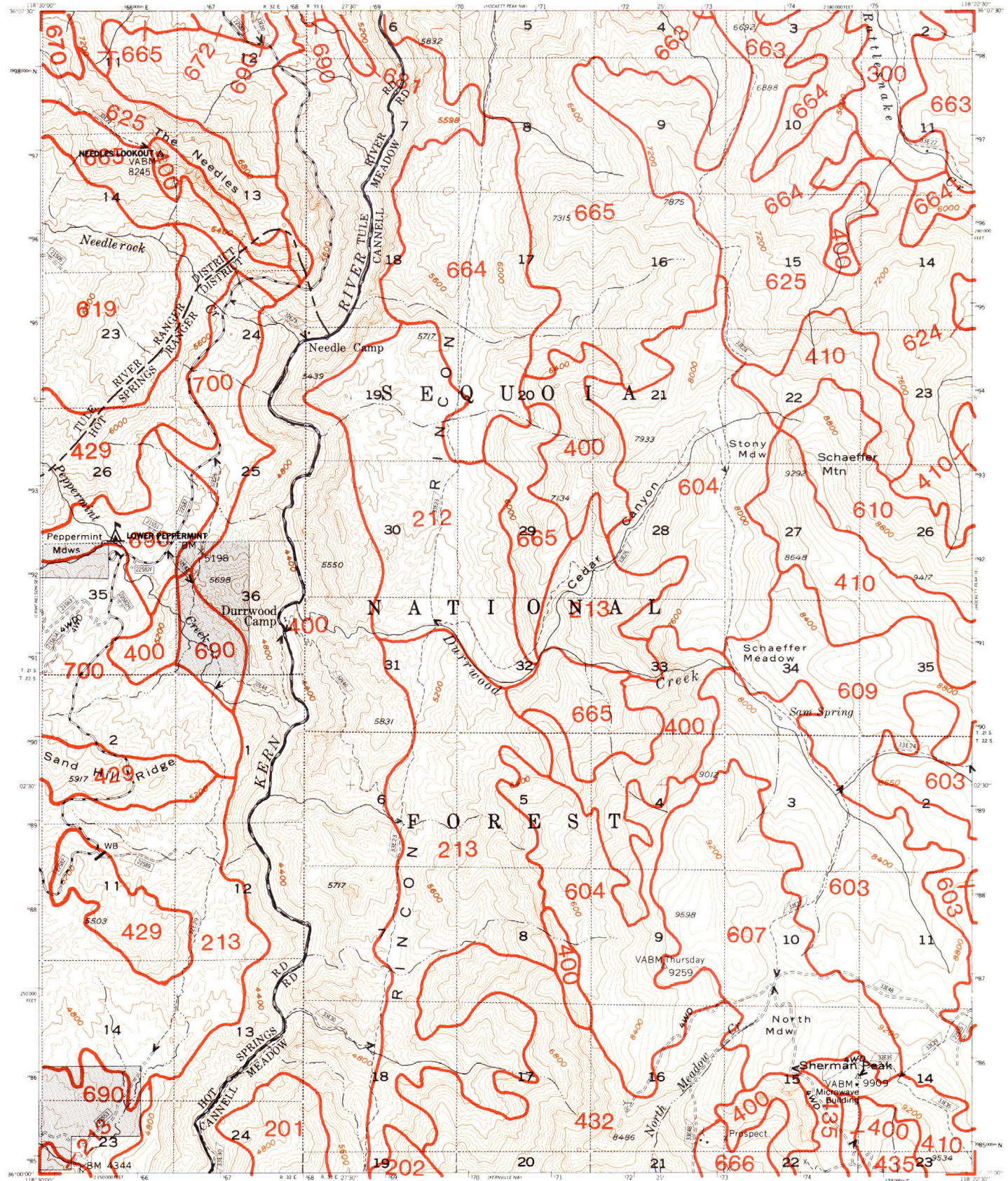


- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

- CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL**
- Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate

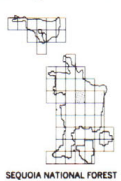
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Trail, Location Approximate

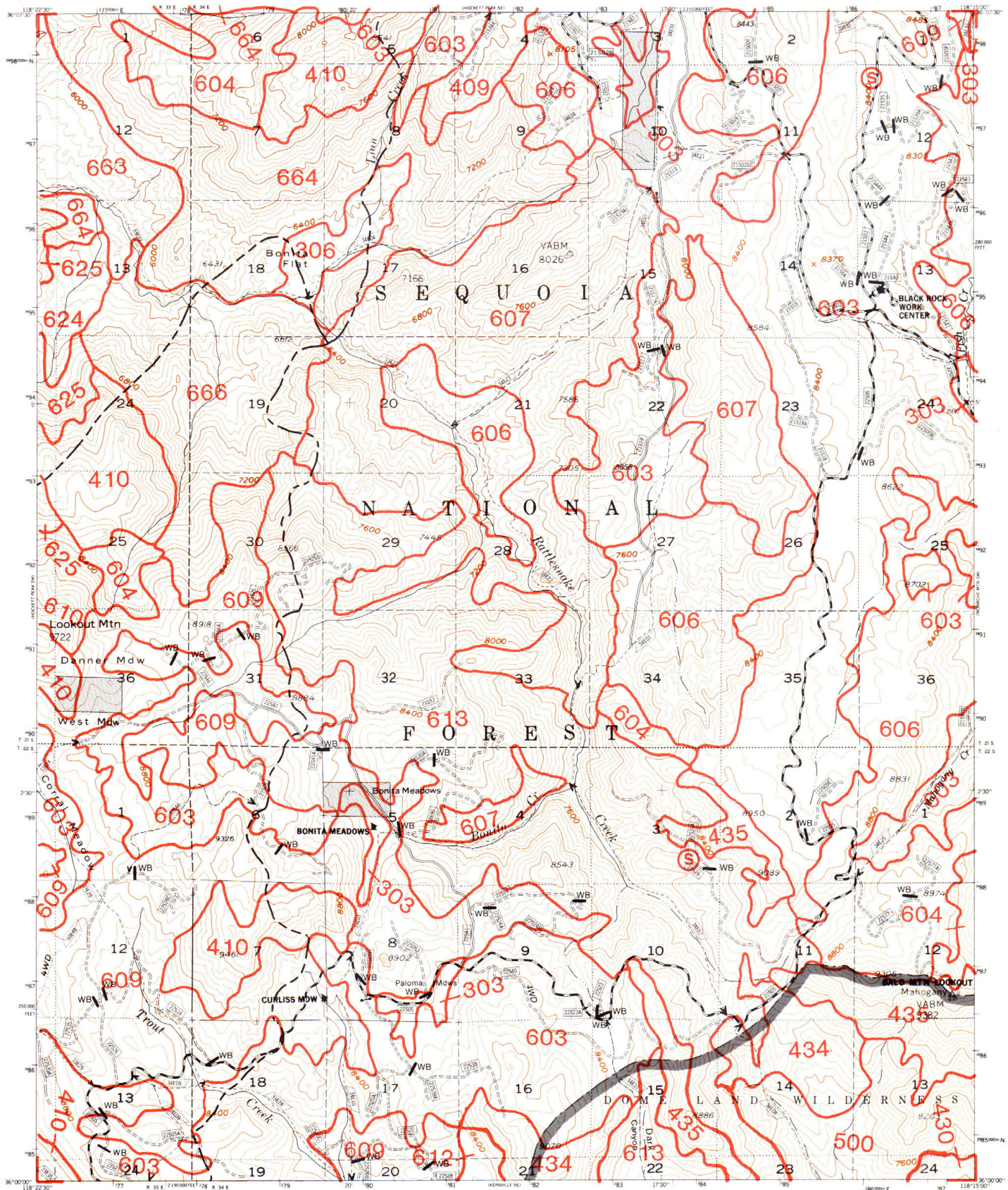




Base map prepared by the U.S. Geological Survey
Control by USGS, USCAGS, and USFS
Topography from aerial photographs by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1953-1955. Field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1,000-meter Universal Transverse Mercator grid ticks,
zone 11.
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

SCALE 1:24,000
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL
National Forest Boundary
Alienated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction
Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate
Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



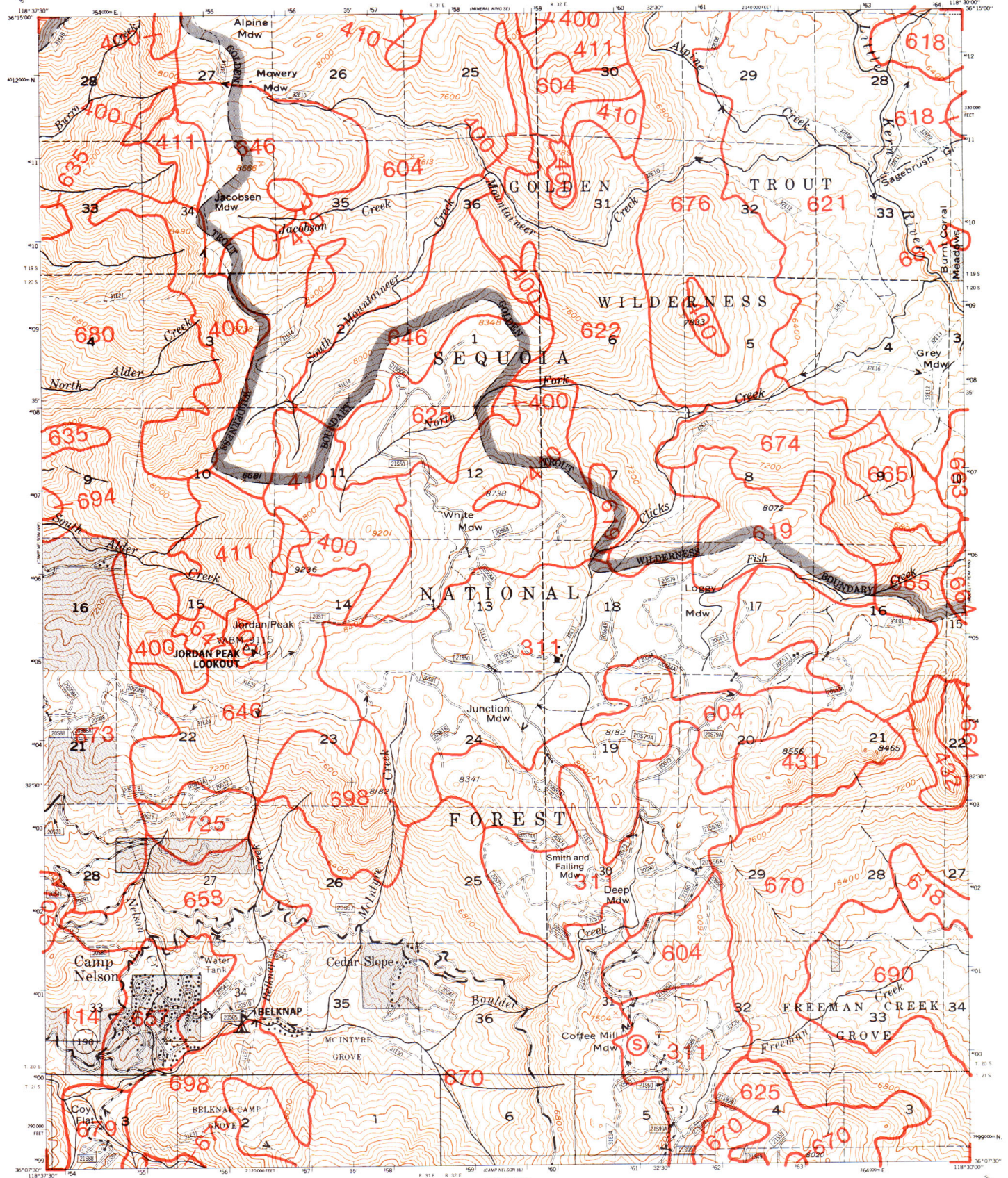


Base map prepared by the U.S. Geological Survey
Control by USGS, USC&GS, and USFS
Topography from aerial photographs by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1953-1955. Field check 1956
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks, zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL
- SCALE 1:24,000
- Legend:
- National Forest Boundary
 - Allocated Land within the National Forest Boundary
 - TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate
 - Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Route
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate





Base map prepared by the U.S. Geological Survey
Control by USGS, USC&GS, and U.S.F.S.

Topography from aerial photographs by photogrammetric methods
by USFS, 1954 and USGS, 1956
Aerial photographs taken 1954. Field check 1956

Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator and ticks,
zone 11

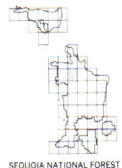
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modified to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



— National Forest Boundary
— Alienated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
— Surveyed, Location Approximate
— Unsurveyed, Protraction

SCALE 1:24,000
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC DATUM OF 1929
— Primary Highway
— Secondary Highway
— Improved Light Duty, Paved
— Improved Light Duty, Gravel
— Improved Light Duty, Dirt
— Unimproved Dirt
— Trail
— Road, Location Approximate

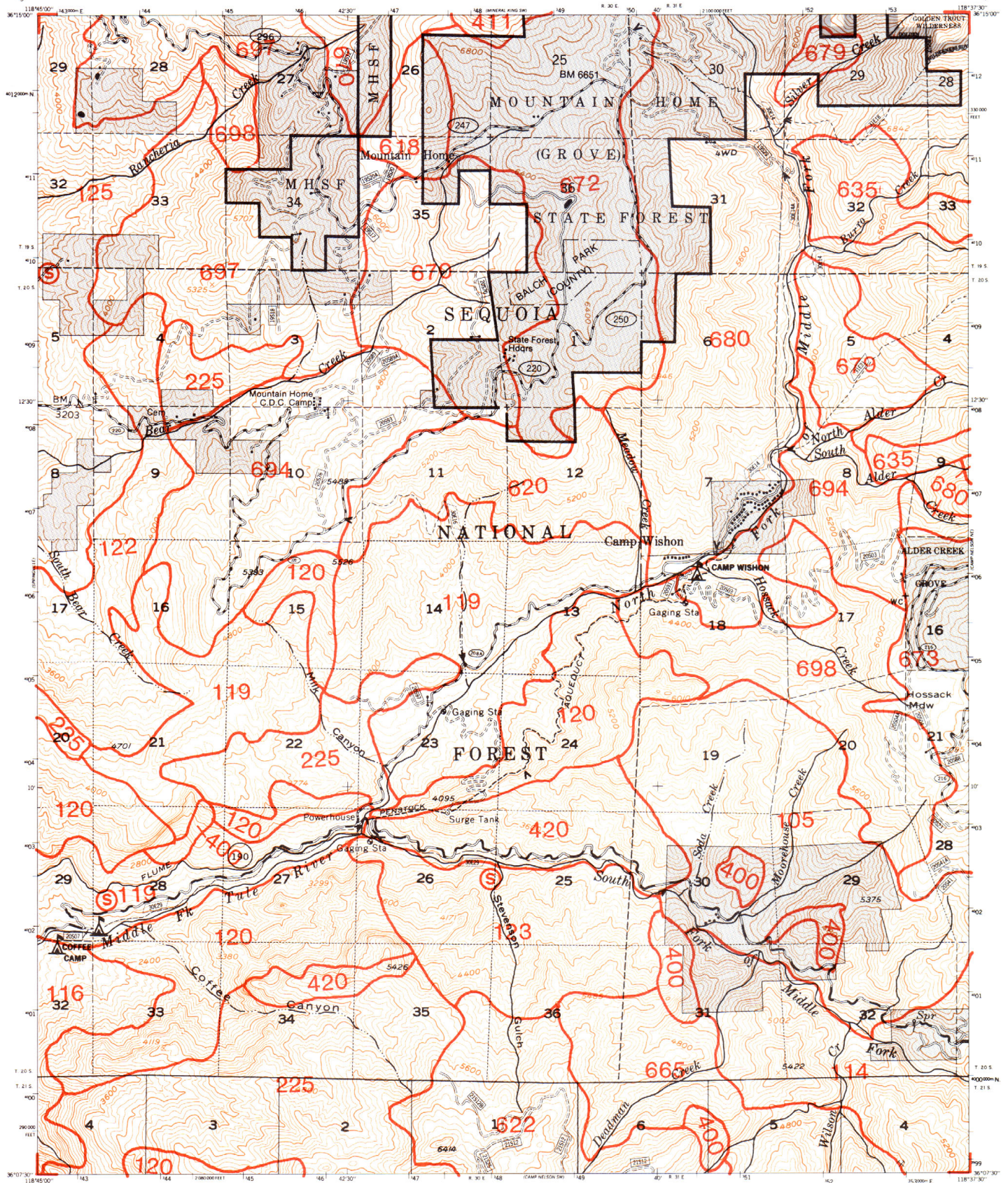
— Interstate
— U.S. Highway
— State Highway
— County Road
— Primary Forest Road
— Forest Road
— Forest Trail
— Trail, Location Approximate



PRIMARY BASE SERIES MAP
CAMP NELSON N.E.
CALIFORNIA

N3607.5-W118307.5

REVISED 1987
308-1C



Base map prepared by the U.S. Geological Survey
Control by USGS, USCGS, and USFS
Topography from aerial photographs by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1954. Field check 1956
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 11
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region

SCALE 1:24,000
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTM GRID AND UTM
MAGNETIC NORTH AT
CENTER OF SHEET

National Forest Boundary
Alienated Land within the National
Forest Boundary

TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction

Primary Highway
Secondary Highway
Improved Light Duty, Pavement
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate

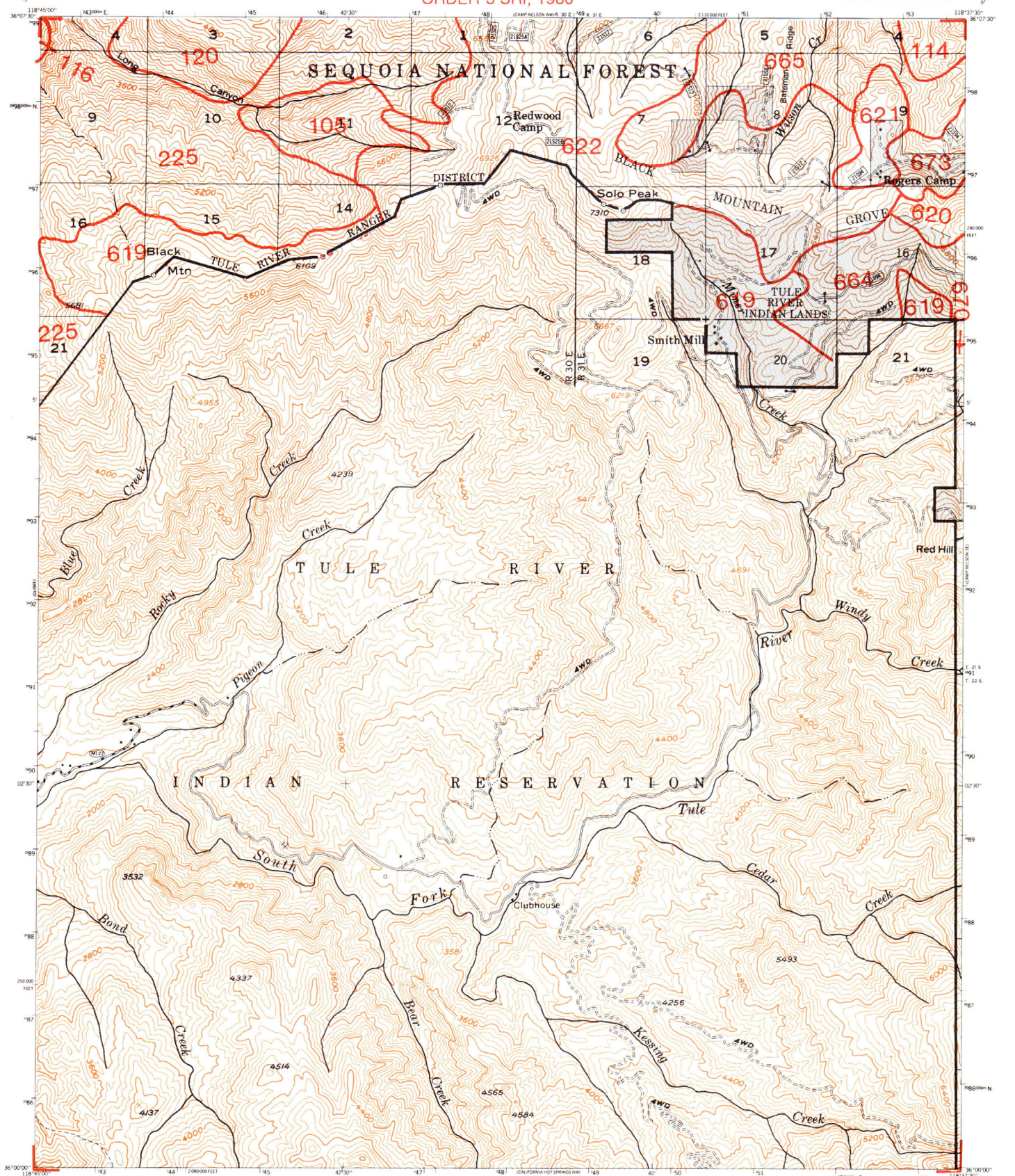
Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate

SEQUOIA NATIONAL FOREST

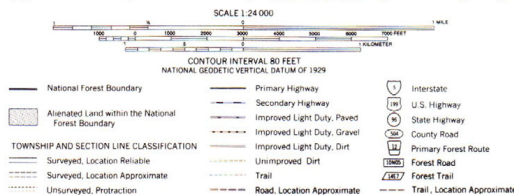
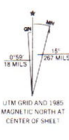
PRIMARY BASE SERIES MAP
CAMP NELSON N.W.
CALIFORNIA
N 3607 5-W 11837 5/7.5
REVISED 1987
308-2C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

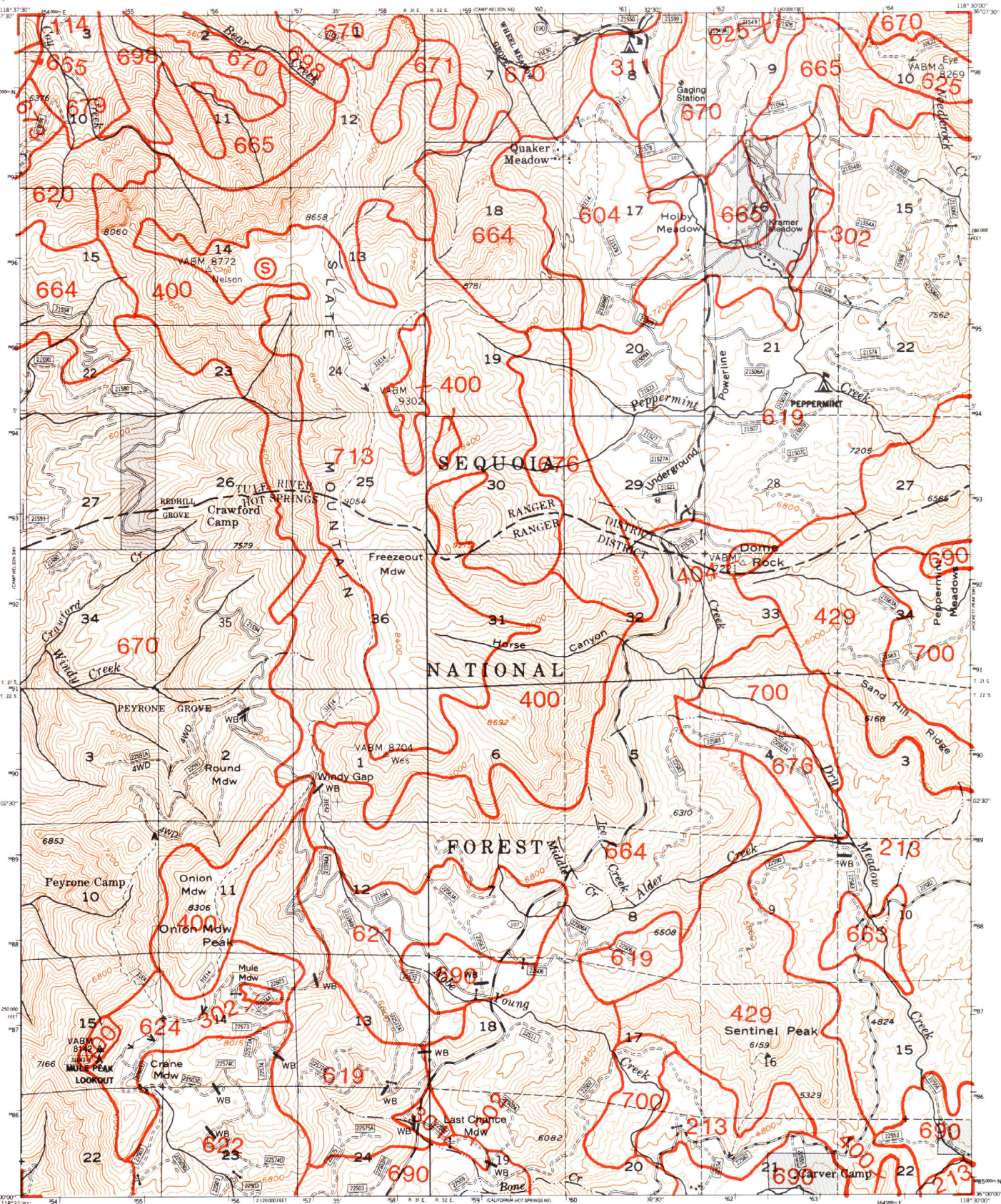
CAMP NELSON SW QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



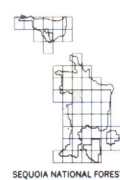
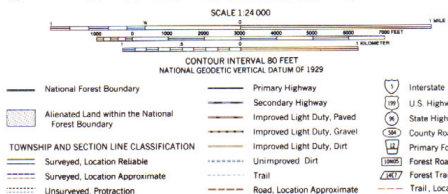
Base map prepared by the U.S. Geological Survey
Control by USGS, USCGS, and USFS
Topography from aerial photographs by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1954 Field check 1956
Polyconic projection, 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks,
zone 11
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



PRIMARY BASE SERIES MAP
CAMP NELSON S.W.
CALIFORNIA
N3600-W11837.5/7.5
REVISED 1987
308-3C



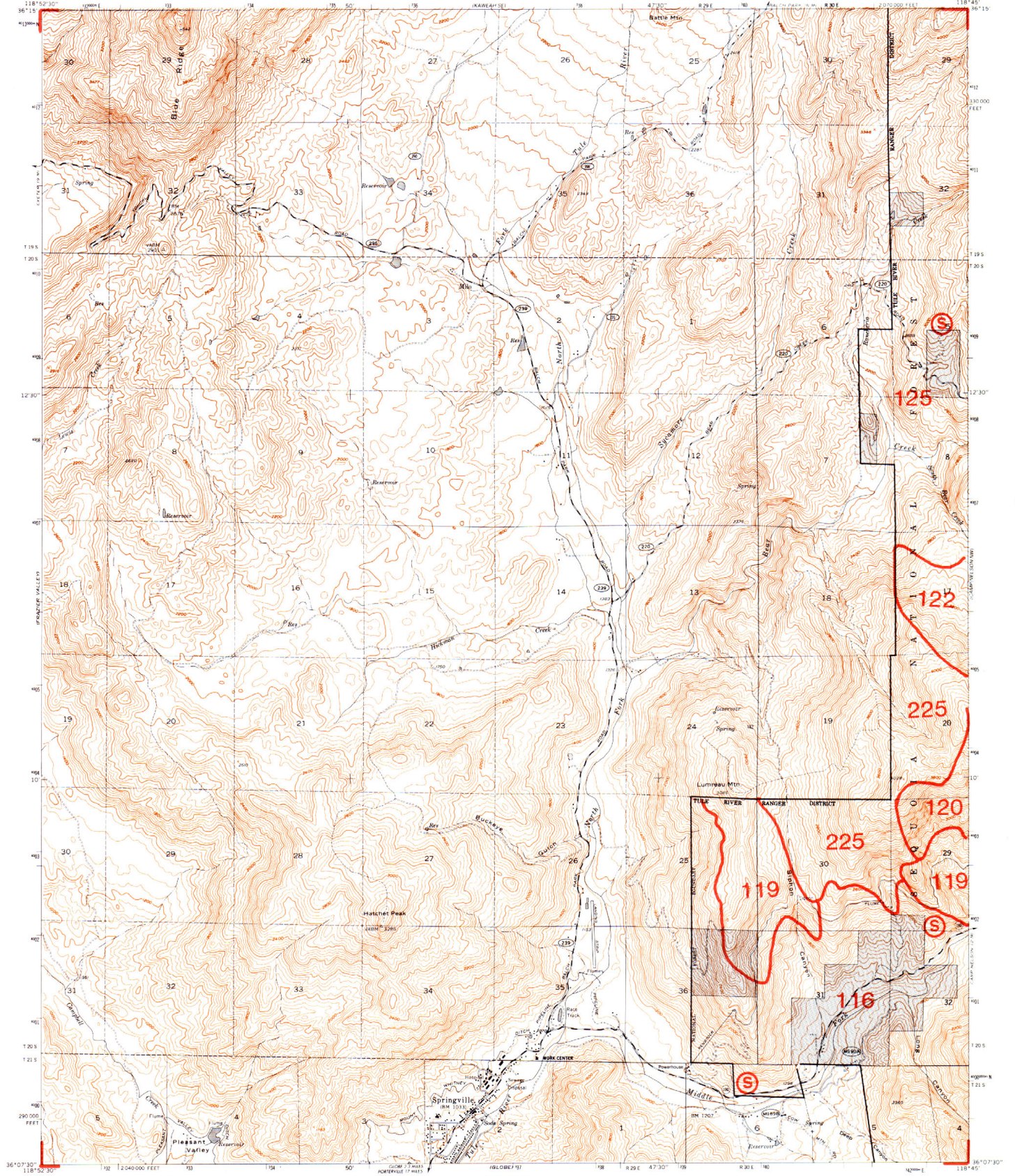
Base map prepared by the U.S. Geological Survey
Control by USGS, USCGS, and USFS
Topography from aerial photographs by photogrammetric methods
by USFS, 1954, and USGS, 1956
Aerial photographs taken 1954. Field check 1956
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks,
zone 11
Unchecked elevations are shown in gray
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



SEQUOIA NATIONAL FOREST SOIL SURVEY AREA NO. 760 ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

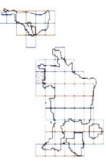
SPRINGVILLE QUADRANGLE
CALIFORNIA-TULARE CO
7.5 MINUTE SERIES (TOPOGRAPHIC)



Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by Wild A-B plotter
Aerial photographs taken 1954. Field check 1957
Polyconic projection. 1927 North American datum.
10,000 foot grid based on California coordinate system,
zone 4.
1000-meter Universal Transverse Mercator grid ticks,
zone 11. Shown in blue.
Modification to USGS base map by the Geomorphics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- SCALE 1:24,000
- CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate
 - Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Road
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate

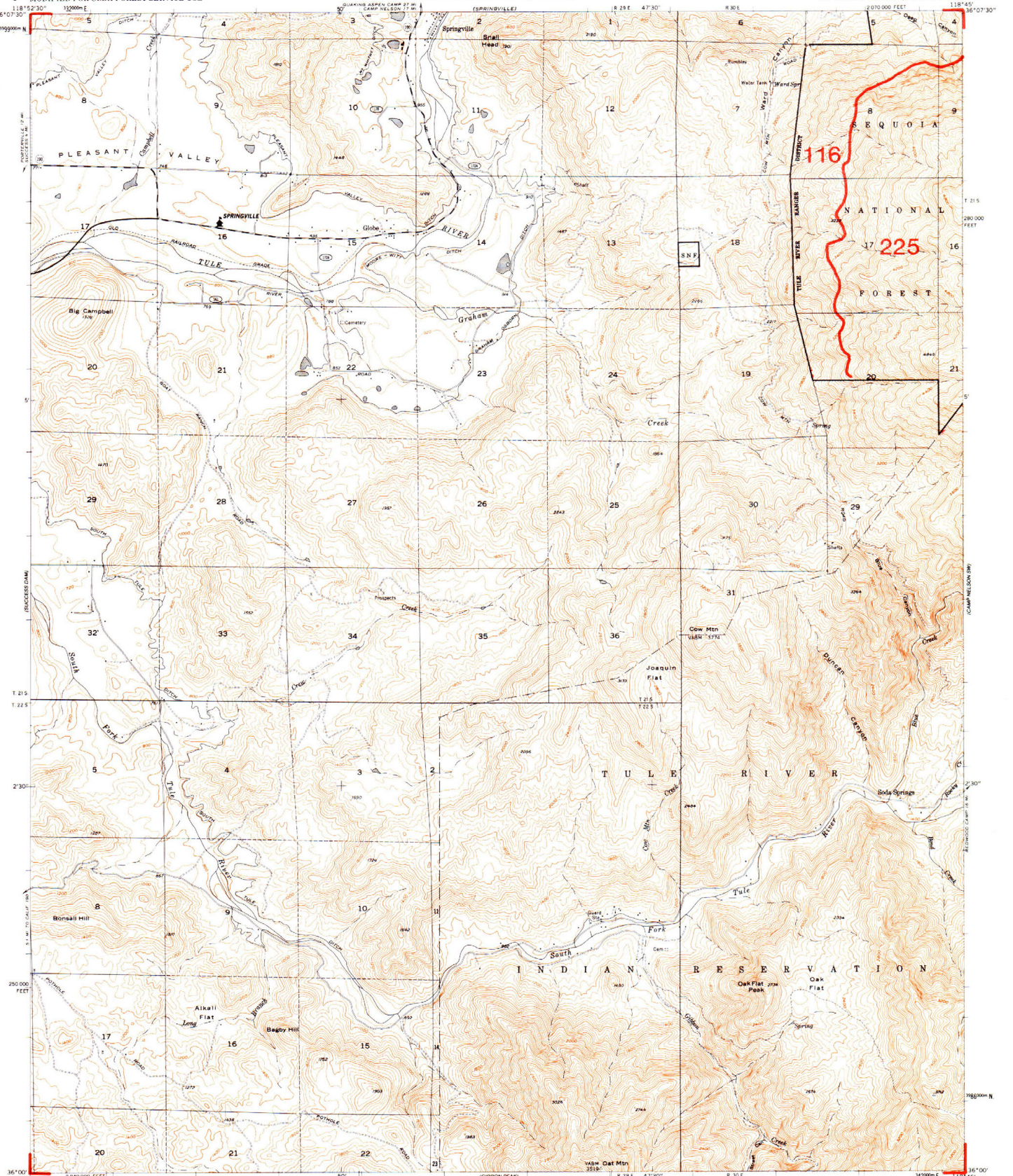


SPRINGVILLE, CALIF.
N3607.5-W11845.7.5
REVISED 1986
DMA 2508 III NE SERIES V895
309-1C

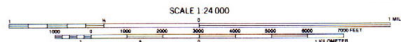
SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

GLOBE QUADRANGLE
CALIFORNIA-TULARE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey
Control by USGS, USC&S, and USFS
Topography from aerial photographs by Wild A-8 plotter
Aerial photographs taken 1954 - Field check 1956
Polyconic projection, 1927 North American datum
10,000-foot and based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator and ticks,
zone 11, shown in blue
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL
- | | |
|------------------------------------------------------|-------------------------------|
| — National Forest Boundary | — Primary Highway |
| — Alienated Land within the National Forest Boundary | — Secondary Highway |
| — Surveyed, Location Reliable | — Improved Light Duty, Paved |
| — Surveyed, Location Approximate | — Improved Light Duty, Gravel |
| — Unserved, Protraction | — Improved Light Duty, Dirt |
| | — Unimproved Dirt |
| | — Trail |
| | — Road, Location Approximate |
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- | | |
|-----------------|-------------------------------|
| — Interstate | — Primary Forest Route |
| — U.S. Highway | — Forest Road |
| — State Highway | — Forest Trail |
| — County Road | — Trail, Location Approximate |



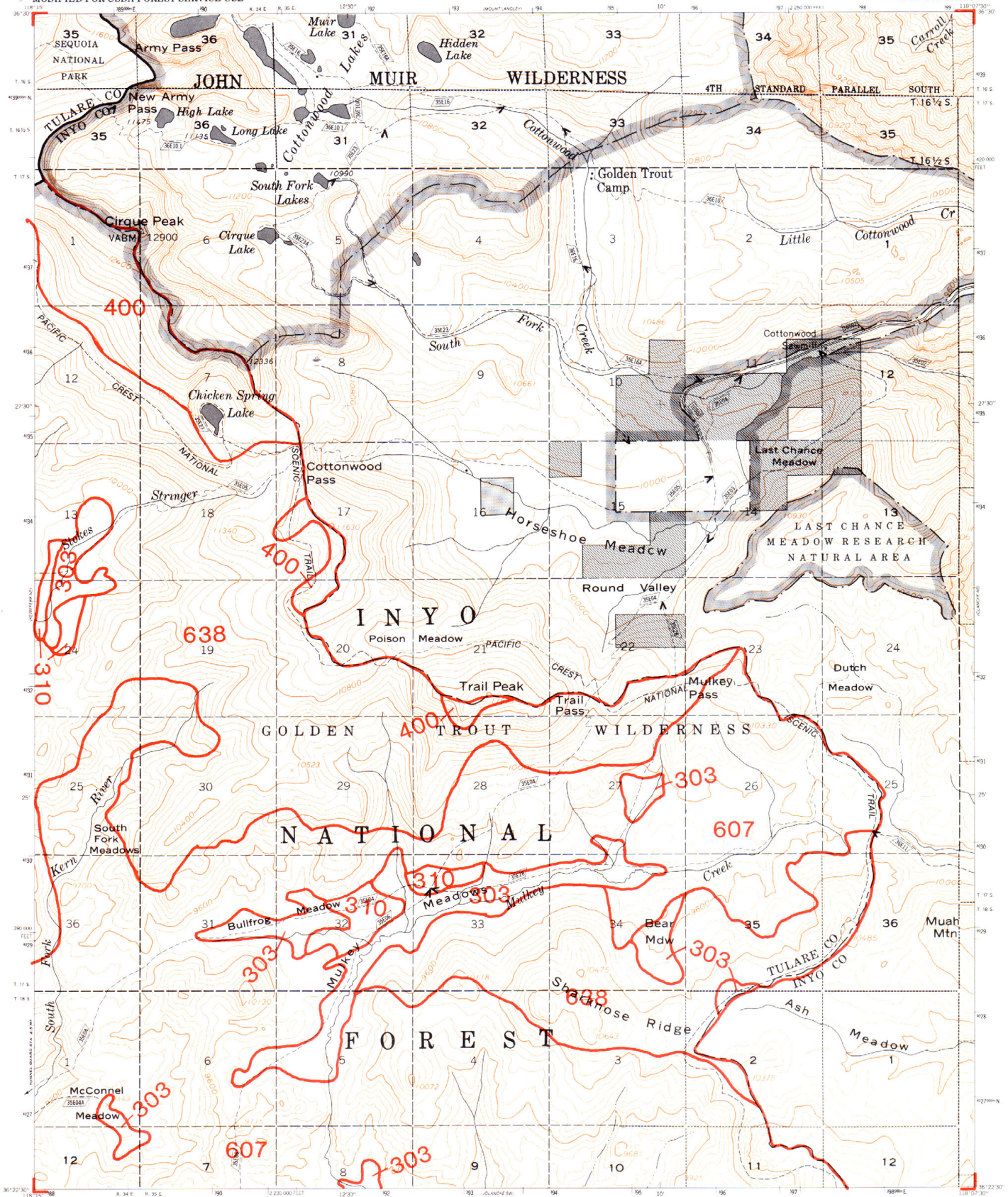
SEQUOIA NATIONAL FOREST

GLOBE, CALIF.
N 3600—W 11845/7.5
REVISED 1985
309-4C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

OLANCHA NW QUADRANGLE
MT DIABLO MERIDIAN
TULARE - INYO CO. CALIFORNIA
7.5 MINUTE SERIES



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1966
Polyconic projection, 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
1000-metre Universal Transverse Mercator grid ticks zone 11
INTERIM EDITION

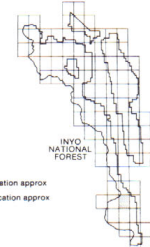
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



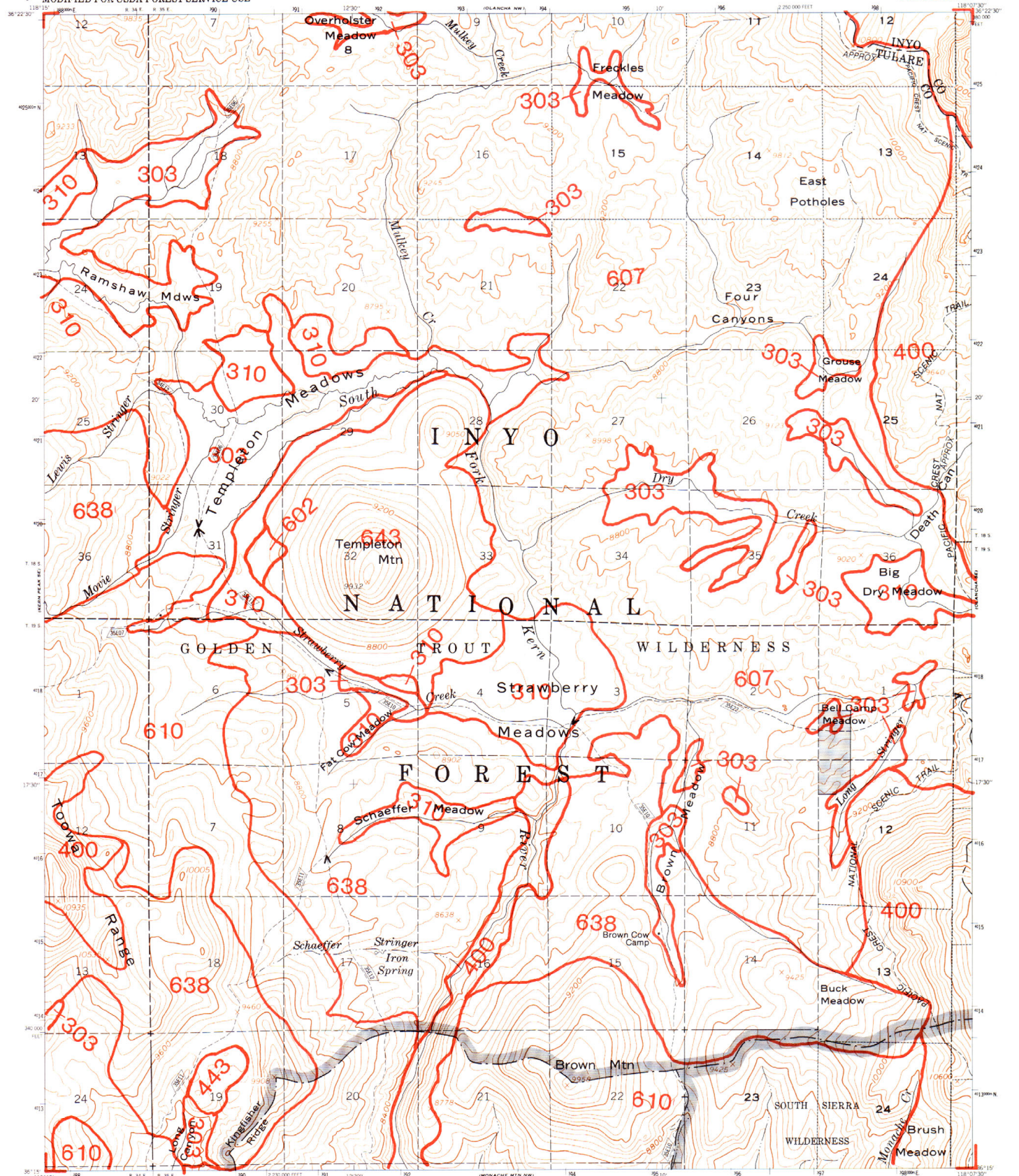
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protection
Landnet revised according to additional Forest Service evidence
City of Los Angeles Land

LEGEND
Primary Highway
Secondary Highway
Improved Light Duty
Unimproved Light Duty
Trail
Locked Gate
Barrier
Railroad
Withdrawn BLM Land

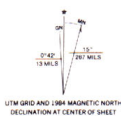
US Highway
State Highway
County Road
Forest Highway
Forest Road
Forest Service Trail location approx
Forest Service Road location approx



OLANCHA NW, CALIF
NAD83 5-W118W 5-T7S
(329-2C)
REVISED 1984



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1956
Polyconic projection 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
10,000-metre Universal Transverse Mercator grid ticks zone 11
INTERIM EDITION
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



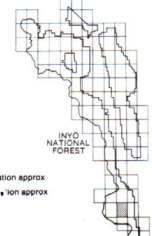
LANDLINE AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction
Landline revised according to additional Forest Service evidence

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

LEGEND

Primary Highway
Secondary Highway
Improved Light Duty
Unimproved Dirt
Trail
Locked Gate
Barrier
Railroad

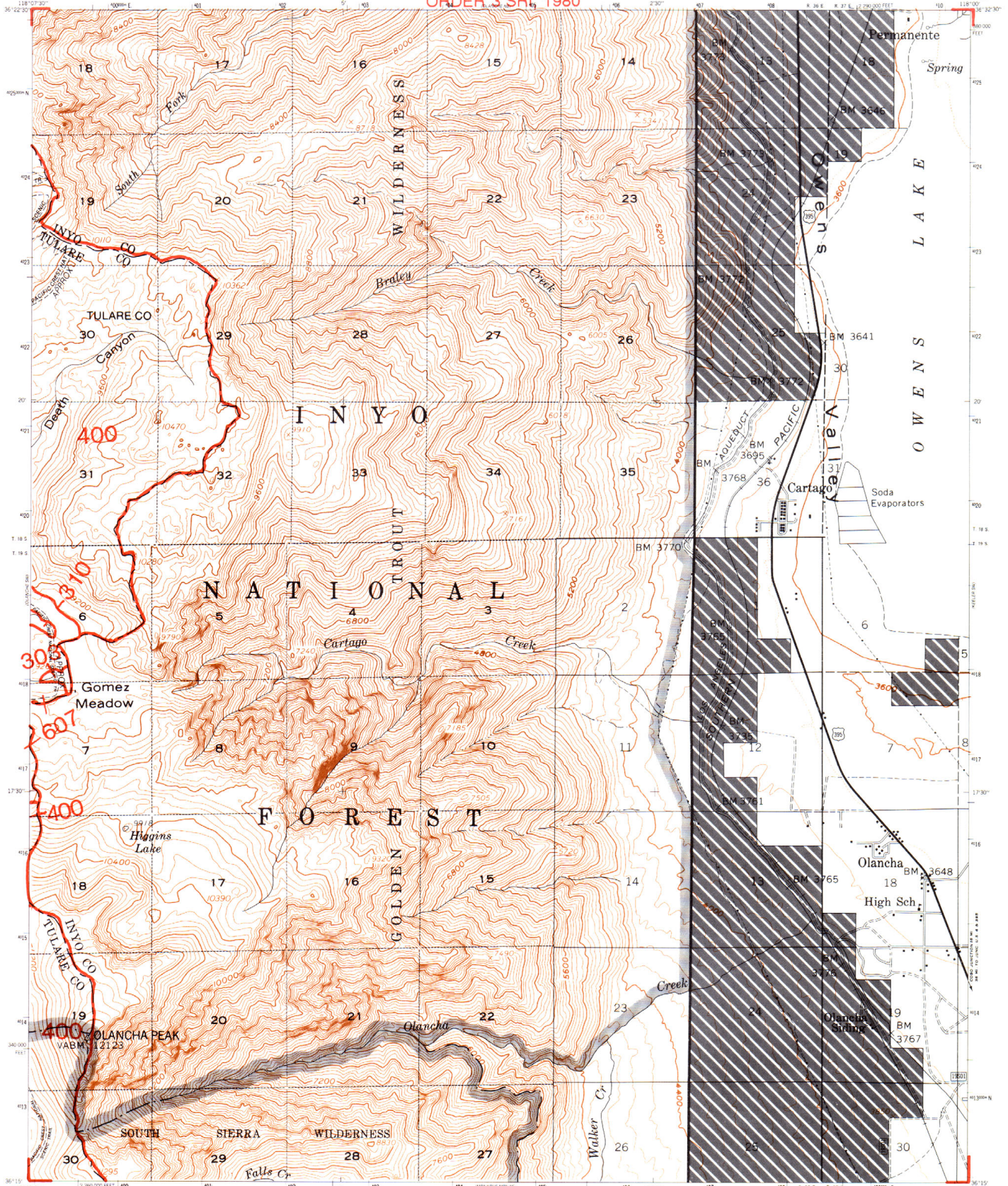
US Highway
State Highway
County Road
Forest Highway
Forest Road
Forest Trail
Forest Service Trail location approx
Forest Service Road location approx



OLANCHA SW, CALIF
N815-W11807.5/7.5
(329-3C)
REVISED 1984

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRL, 1980

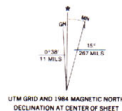
OLANCHA SE QUADRANGLE
MT DIABLO MERIDIAN
TULARE- INYO CO, CALIFORNIA
7.5 MINUTE SERIES



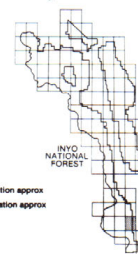
Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs
Map edited 1956

Polycyclic projection - 1927 North American datum
10,000 foot grid based on California coordinate system zone 11
1000 metre Universal Transverse Mercator grid ticks zone 11

INTERIM EDITION
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



- LEGEND**
- National Forest Boundary
 - Alienated Land within the Forest Boundary as of 1984
 - TOWNSHIP AND SECTION LINE CLASSIFICATION
 - Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
 - Landset revised according to additional Forest Service evidence
 - City of Los Angeles Land
 - Withdrawn BLM Land
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty
 - Unimproved Dirt
 - Trail
 - Locked Gate
 - Barrier
 - Railroad
 - US Highway
 - State Highway
 - County Road
 - Forest Highway
 - Forest Road
 - Forest Trail
 - Forest Service Trail location approx
 - Forest Service Road location approx

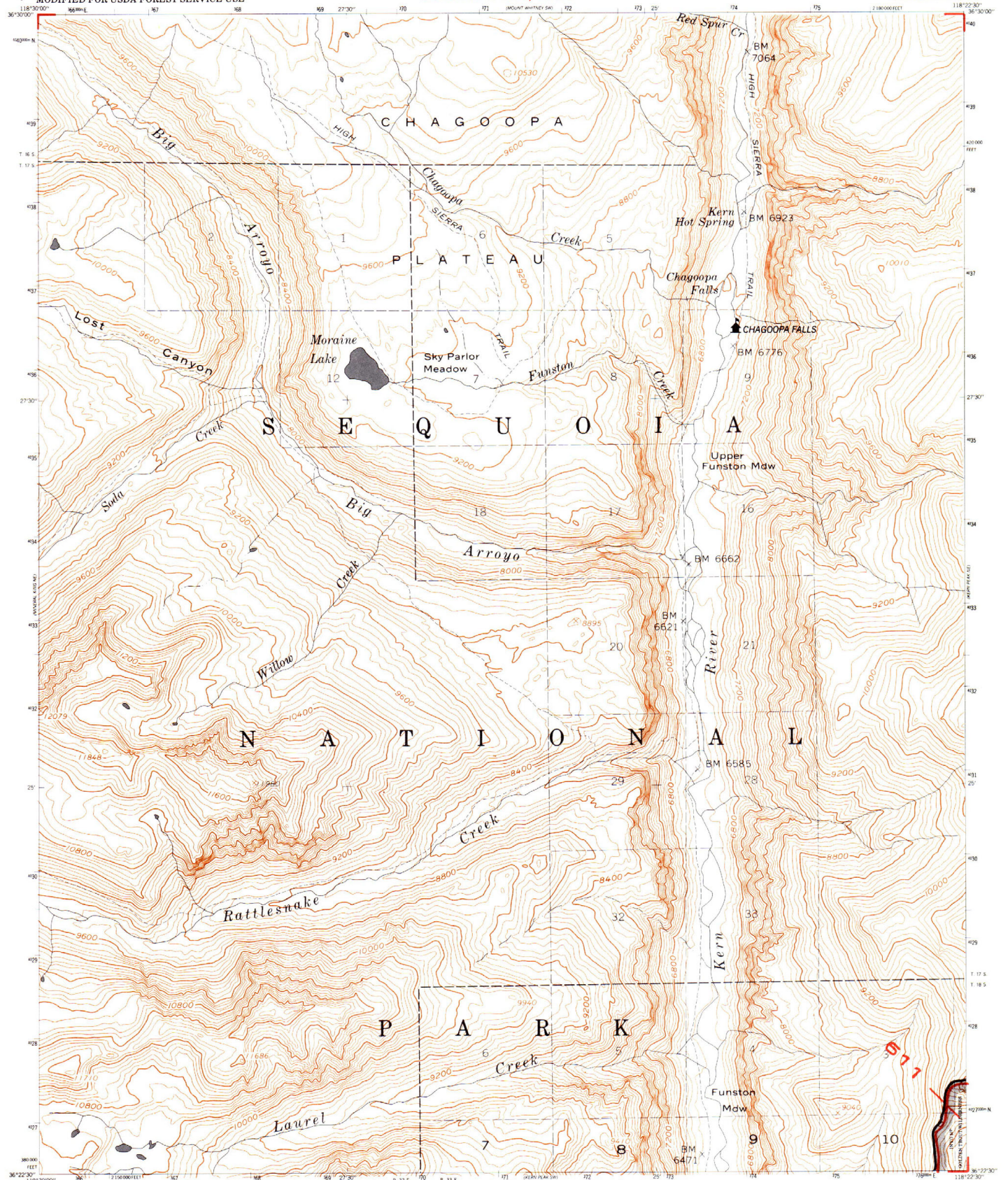


OLANCHA SE, CALIF
N3615-W11800/7.5
(329-4C)
REVISED 1984

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

KERN PEAK NW QUADRANGLE
TULARA CO., CALIFORNIA
MT DIABLO MERIDIAN
7.5 MINUTE SERIES



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs

Polycyclic projection. 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
10,000-metre Universal Transverse Mercator grid ticks zone 11

INTERIM EDITION

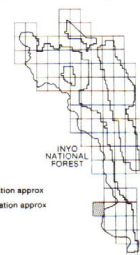
Photorevised by the Geomatics Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region



SCALE 1:24,000

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

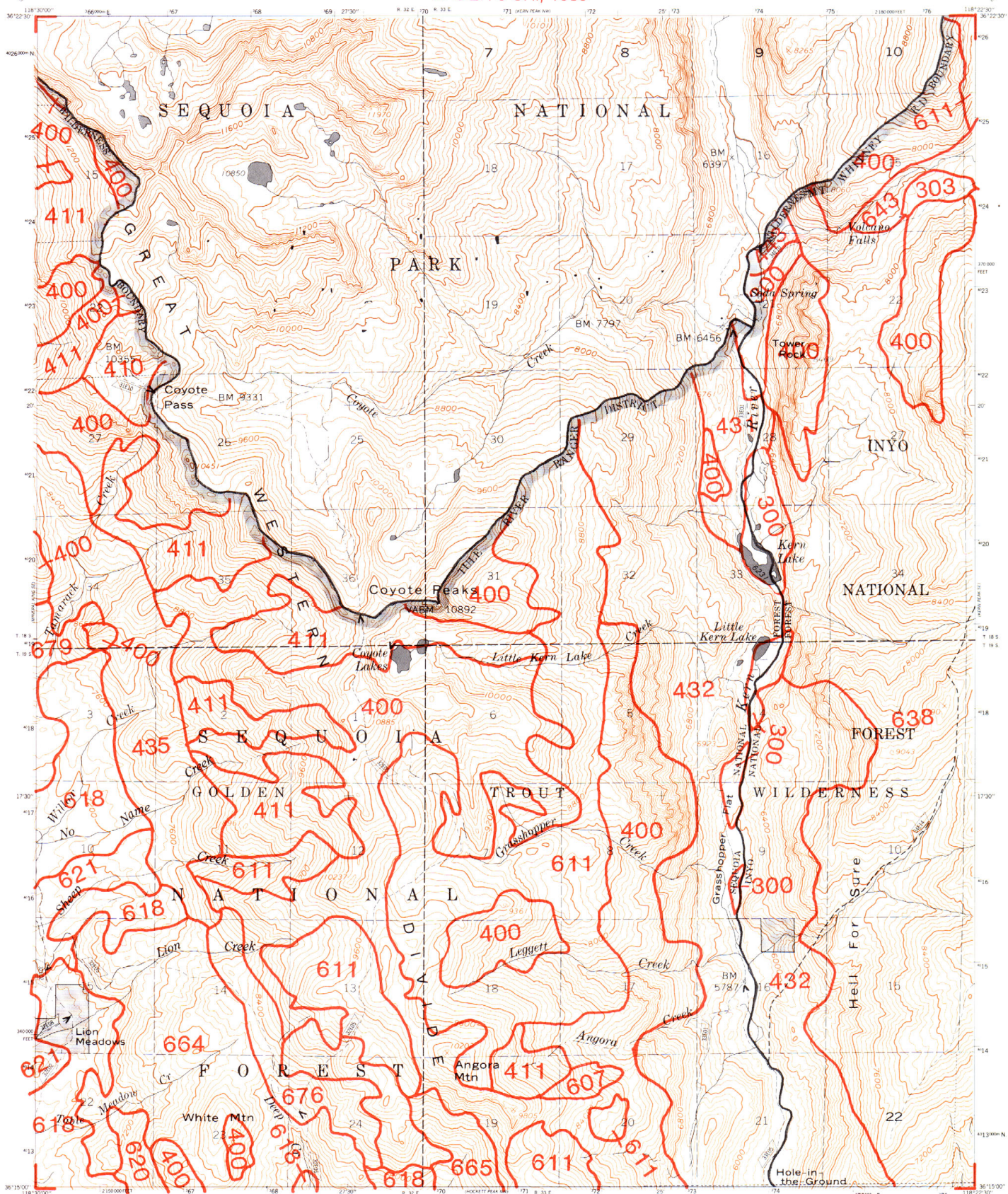
- LEGEND**
- | | | |
|------------------------------------------------------------------|---------------------|--------------------------------------|
| National Forest Boundary | Primary Highway | US Highway |
| Alienated Land within the Forest Boundary as of 1984 | Secondary Highway | State Highway |
| TOWNSHIP AND SECTION LINE CLASSIFICATION | Improved Light Duty | County Road |
| Surveyed, Location Reliable | Unimproved Dirt | Forest Highway |
| Surveyed, Location Approximate | Trail | Forest Road |
| Unsurveyed, Protection | Locked Gate | Forest Trail |
| Barrier | Railroad | Forest Service Trail location approx |
| Landmark revised according to additional Forest Service evidence | | Forest Service Road location approx |



KERN PEAK NW, CALIF.
N3822.5-W11822.5/7.5
(330-2C)
REVISED 1984

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

KERN PEAK SW QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



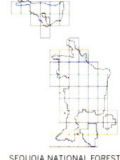
Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Advance field check 1956
Polyconic projection. 1927 North American datum
10,000 foot grid based on California coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 12

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service
Center from 1982 and 1983 aerial photography and 1984
correction guides, furnished by the US Pacific West Region



- TOWNSHIP AND SECTION LINE CLASSIFICATION
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

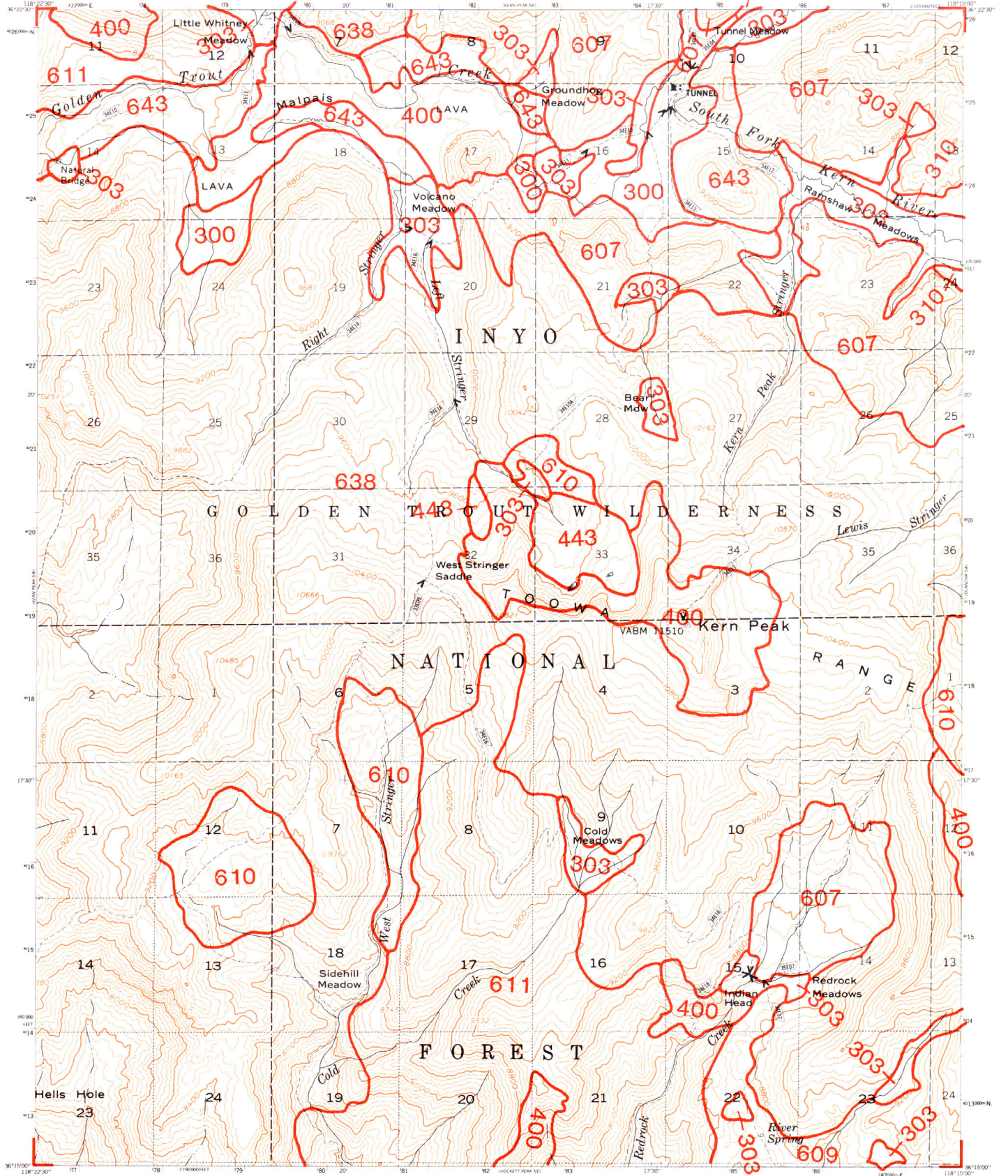
- CONTOUR INTERVAL: 80 FEET
DATUM IS MEAN SEA LEVEL
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate
 - Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Route
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

KERN PEAK SE QUADRANGLE
TULARE CO., CALIFORNIA
MT DIABLO MERIDIAN
7.5 MINUTE SERIES

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE



Base map prepared by the U.S. Geological Survey
Topography by photogrammetric methods from aerial photographs

Polycyclic projection, 1927 North American datum
10,000-foot grid based on California coordinate system zone 4
1000-metre Universal Transverse Mercator grid ticks zone 11
INTERIM EDITION

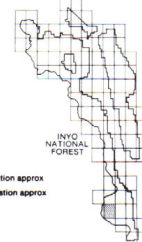
Photorevised by the Geomatrix Service Center in 1984
from USFS aerial photographs and 1984 correction guides
furnished by the Pacific Southwest Region

UTM GRID AND 1984 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

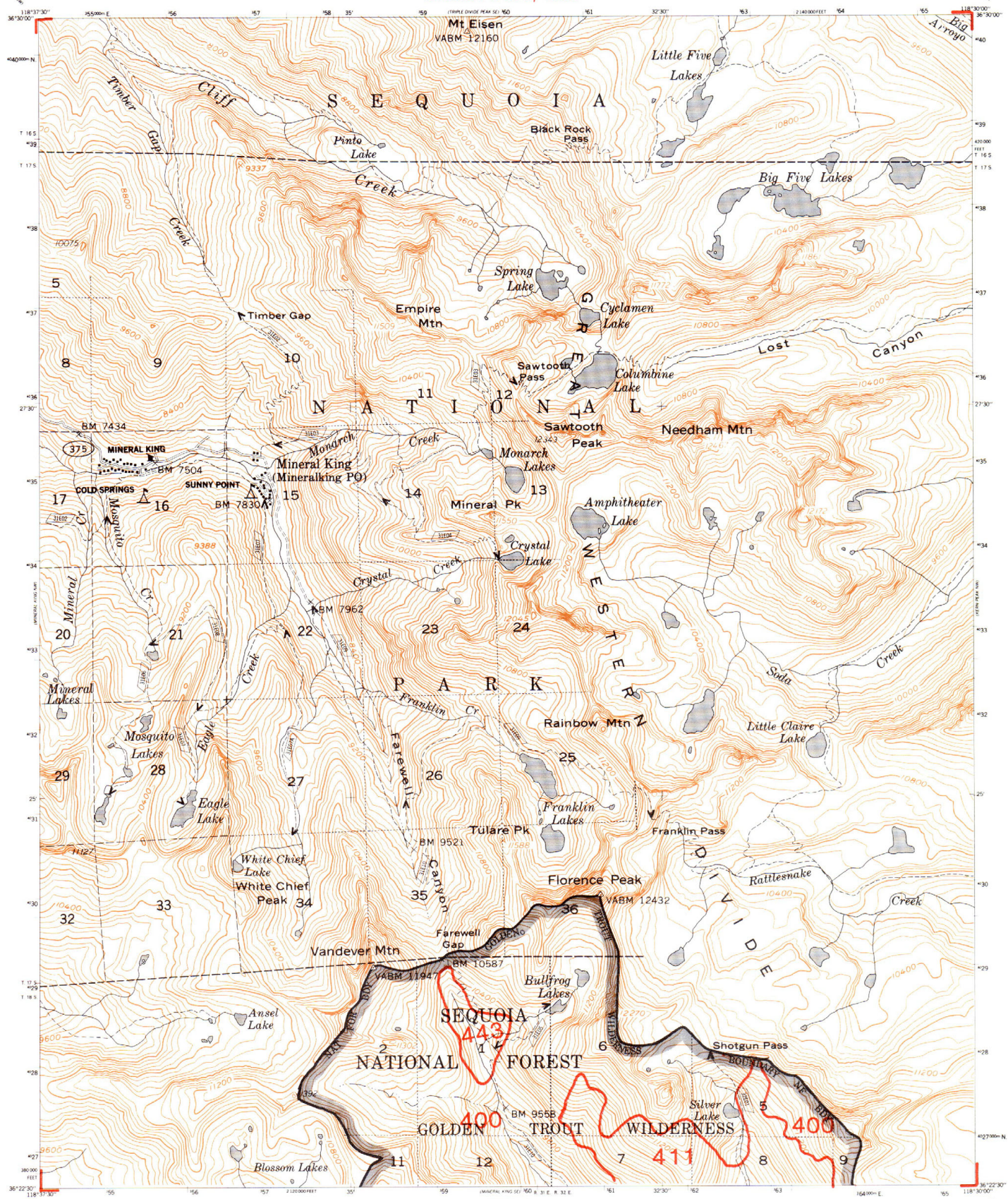
SCALE 1:24,000
CONTOUR INTERVAL, 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

LEGEND

| | | |
|------------------------------------------------------------------|---------------------|--------------------------------------|
| National Forest Boundary | Primary Highway | US Highway |
| Alienated Land within the Forest Boundary as of 1984 | Secondary Highway | State Highway |
| TOWNSHIP AND SECTION LINE CLASSIFICATION | Improved Light Duty | County Road |
| Surveyed, Location Reliable | Unimproved Dirt | Forest Highway |
| Surveyed, Location Approximate | Trail | Forest Road |
| Unsurveyed, Protection | Locked Gate | Forest Trail |
| Landmark revised according to additional Forest Service evidence | Barrier | Forest Service Trail location approx |
| | Railroad | Forest Service Road location approx |



KERN PEAK SE, CALIF.
N8615-W11815/7.5
(330-4C)
REVISED 1984

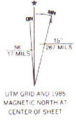


Base map prepared by the U.S. Geological Survey
in cooperation with California Department of Water Resources
Control by USGS and USFWS

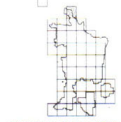
Topography by photogrammetric methods from aerial
photographs taken 1955. Field checked 1956.
Limited revision in 1967

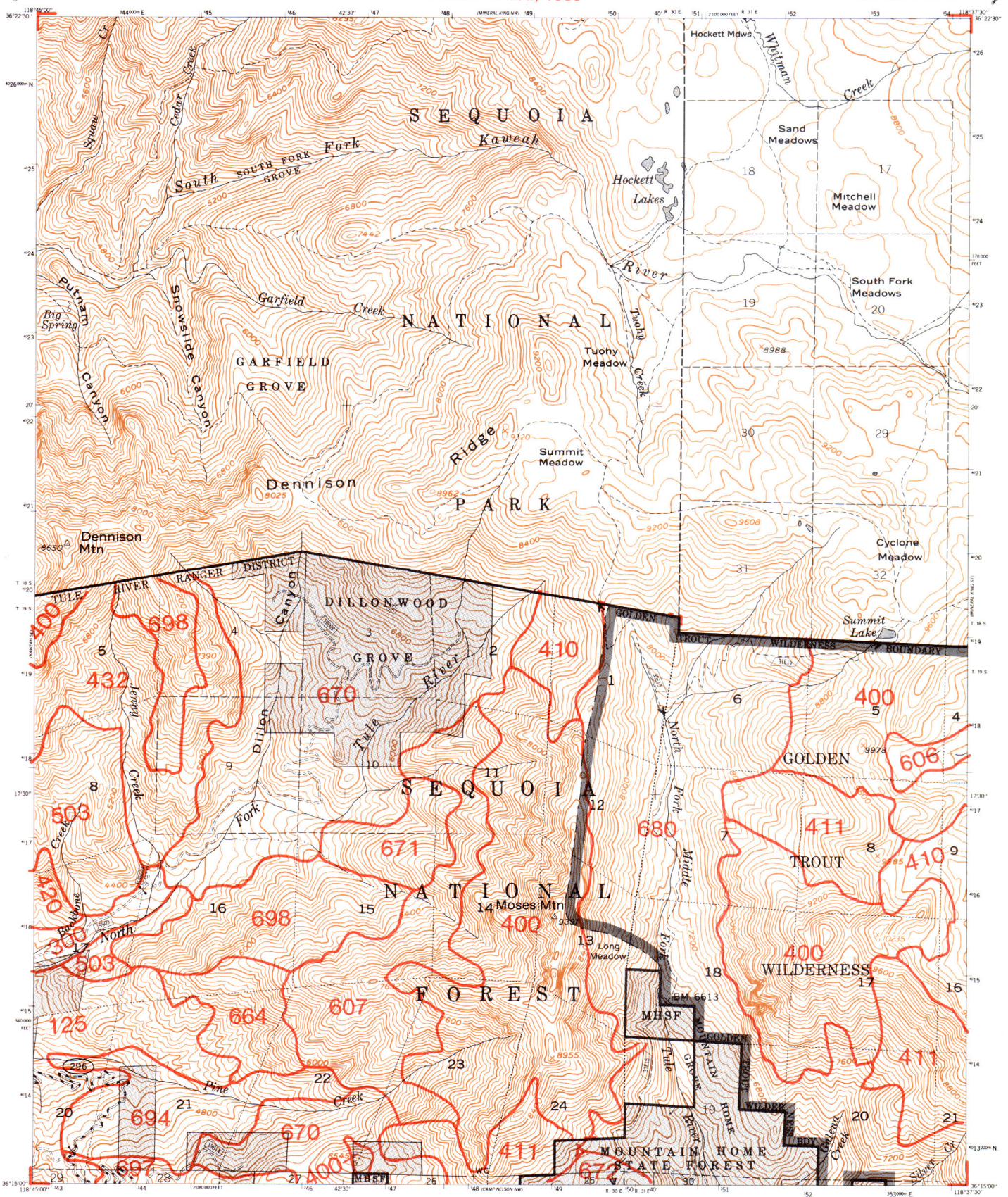
Projection: 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks,
zone 11

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- Surveyed, Location Reliable
- Surveyed, Location Approximate
- Unsurveyed Projection
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Road
- Forest Road
- Forest Trail
- Trail, Location Approximate

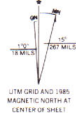




Base map prepared by the U.S. Geological Survey in cooperation with California Department of Water Resources. Control by USGS and USCAGS.

Topography by photogrammetric methods from aerial photographs taken 1955. Field checked 1956. Limited revision in 1967.
Polyconic projection. 1927 North American datum. 10,000-foot grid based on California coordinate system, zone 4. 1000-meter Universal Transverse Mercator grid ticks, zone 11.

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Service Center from 1962 and 1983 aerial photography and 1984 correction guides furnished by the FS Pacific Southwest Region



- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction

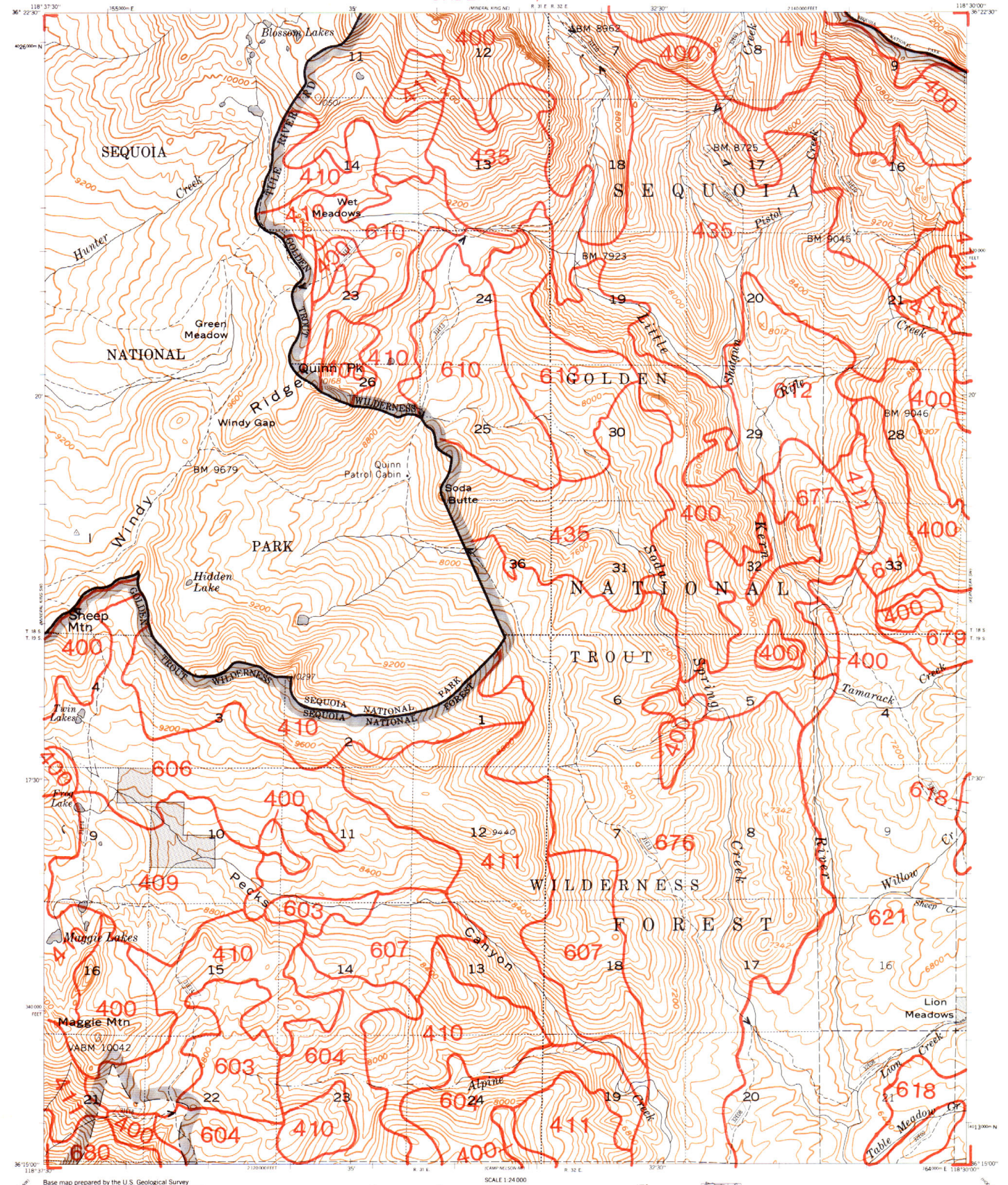
- CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL**
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

MINERAL KING SE QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



Base map prepared by the U.S. Geological Survey
in cooperation with California Department of Water Resources
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial
photographs taken 1955. Field checked 1956.
Limited revision in 1967.
Polyconic projection. 1927 North American datum.
10,000-foot grid based on California coordinate system, zone 4
1,000-meter Universal Transverse Mercator grid ticks,
zone 11.
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatrix Software
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



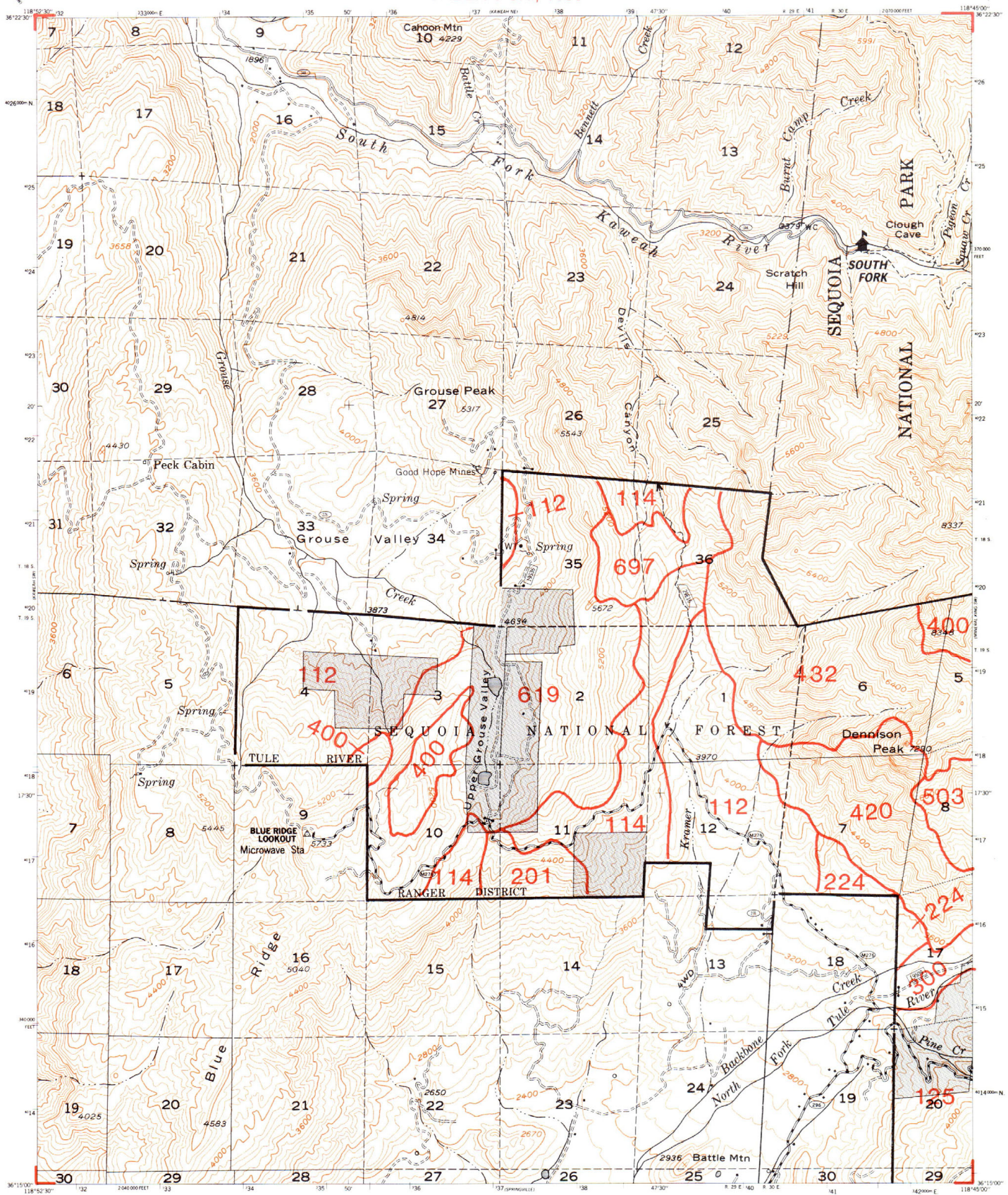
- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protraction
- ROAD CLASSIFICATION**
- Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate
- Other Symbols**
- National Forest Boundary
 - Alienated Land within the National Forest Boundary
 - Interstate
 - U.S. Highway
 - State Highway
 - County Road
 - Primary Forest Route
 - Forest Road
 - Forest Trail
 - Trail, Location Approximate



PRIMARY BASE SERIES MAP
MINERAL KING S.E.
CALIFORNIA
N3615-W11830/7.5
REVISED 1985
331-4C

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

KAWEAH SE QUADRANGLE
CALIFORNIA-TULARE COUNTY
MT. DIABLO PRINCIPLE MERIDIAN



Base map prepared by the U.S. Geological Survey
in cooperation with California Department of Water Resources
Control by USGS, USC&GS, and U.S. Forest Service
Topography by photogrammetric methods from aerial
photographs taken 1954. Field checked 1957. Limited
revision in 1967

Polyconic projection, 1927 North American datum
10,000 foot grid based on California coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 11

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



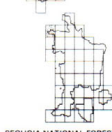
National Forest Boundary
Alienated Land within the National Forest Boundary

TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protection

CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Primary Highway
Secondary Highway
Improved Light Duty, Paved
Improved Light Duty, Gravel
Improved Light Duty, Dirt
Unimproved Dirt
Trail
Road, Location Approximate

Interstate
U.S. Highway
State Highway
County Road
Primary Forest Route
Forest Road
Forest Trail
Trail, Location Approximate



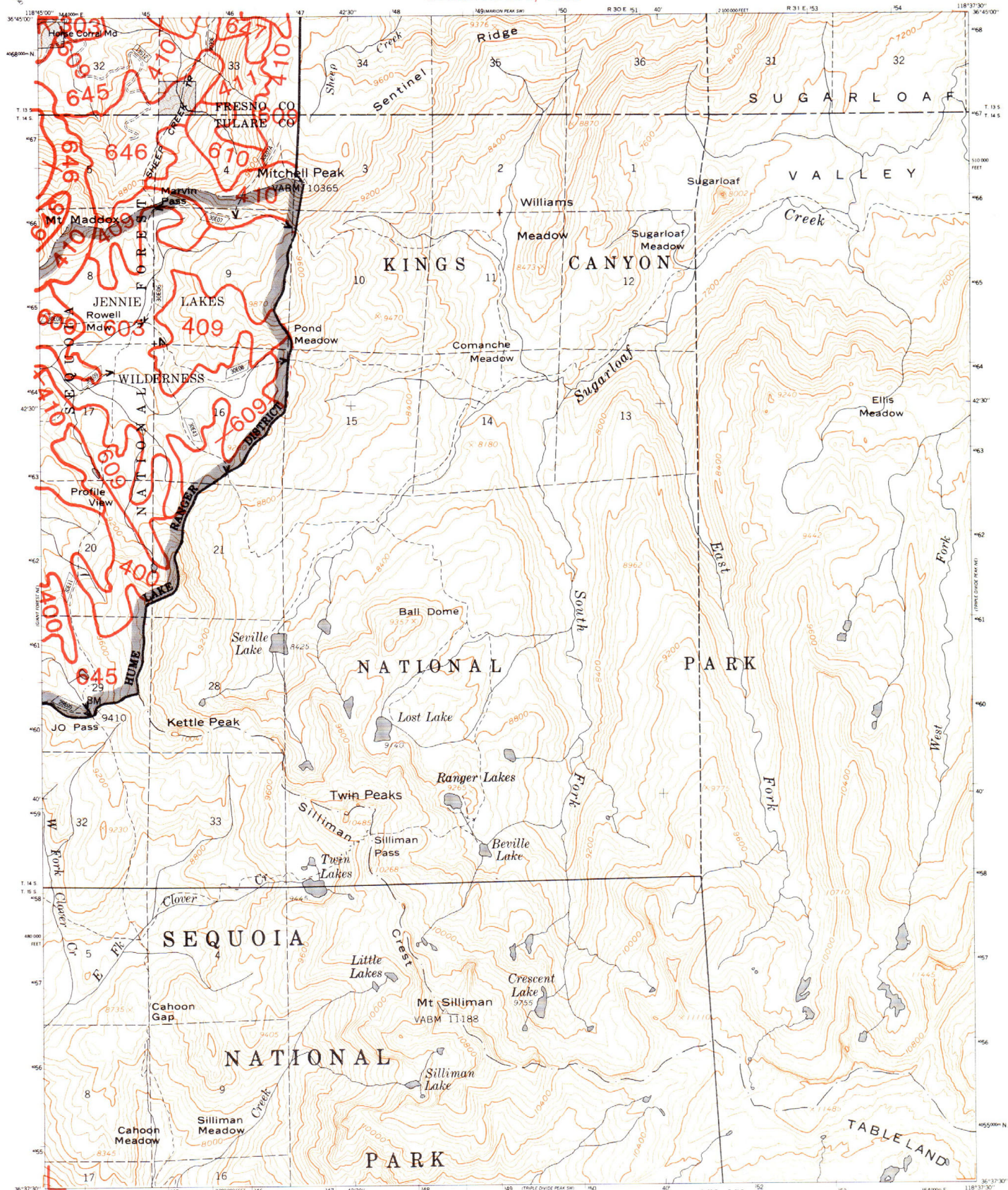
PRIMARY BASE SERIES MAP

KAWEAH S.E.
CALIFORNIA

N3615-W11845/7.5

REVISED 1986

332-4C



Base map prepared by the U.S. Geological Survey
in cooperation with California Department of Water Resources
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial
photographs taken 1955. Field checked 1956.
Limited revision in 1967.
Polyconic projection. 1927 North American datum.
10,000-foot grid based on California coordinate system, zone 4
1900-meter Universal Transverse Mercator grid and ticks,
zone 11

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- TOWNSHIP AND SECTION LINE CLASSIFICATION**
- Surveyed, Location Reliable
 - Surveyed, Location Approximate
 - Unsurveyed, Protection

- CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL**
- Primary Highway
 - Secondary Highway
 - Improved Light Duty, Paved
 - Improved Light Duty, Gravel
 - Improved Light Duty, Dirt
 - Unimproved Dirt
 - Trail
 - Road, Location Approximate

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate



SCALE 1:24,000



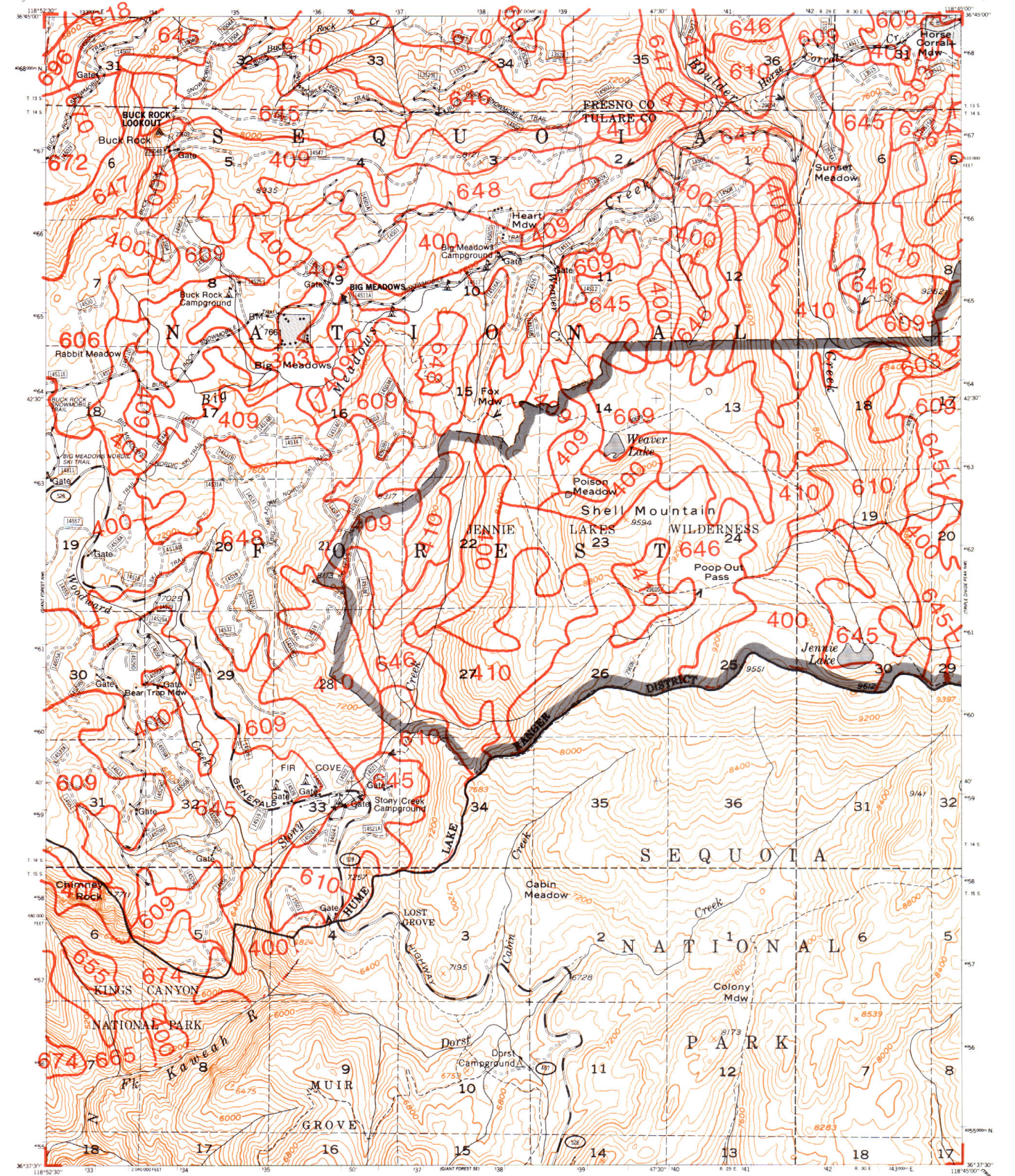
SEQUOIA NATIONAL FOREST

PRIMARY BASE SERIES MAP
TRIPLE DIVIDE PEAK N.W.
CALIFORNIA

N3837.5-W11837.5/7.5

REVISED 1985

353-2C



Base map prepared by the U.S. Geological Survey in cooperation with California Department of Water Resources. Control by USGS and USCGS. Topography by photogrammetric methods from aerial photographs taken 1954. Field checked 1956. Limited revision 1967. Photocentric projection. 1927 North American datum. 10,000 foot and based on California coordinate system, zone 4. 1000-meter Universal Transverse Mercator and ticks, zone 11. INTERMEDIATE EDITION. Modified to USGS base map by the Geomatics Service Center from 1982 and 1983 aerial photography and 1984 correction guides furnished by the FS Pacific Southwest Region.

SCALE 1:24,000

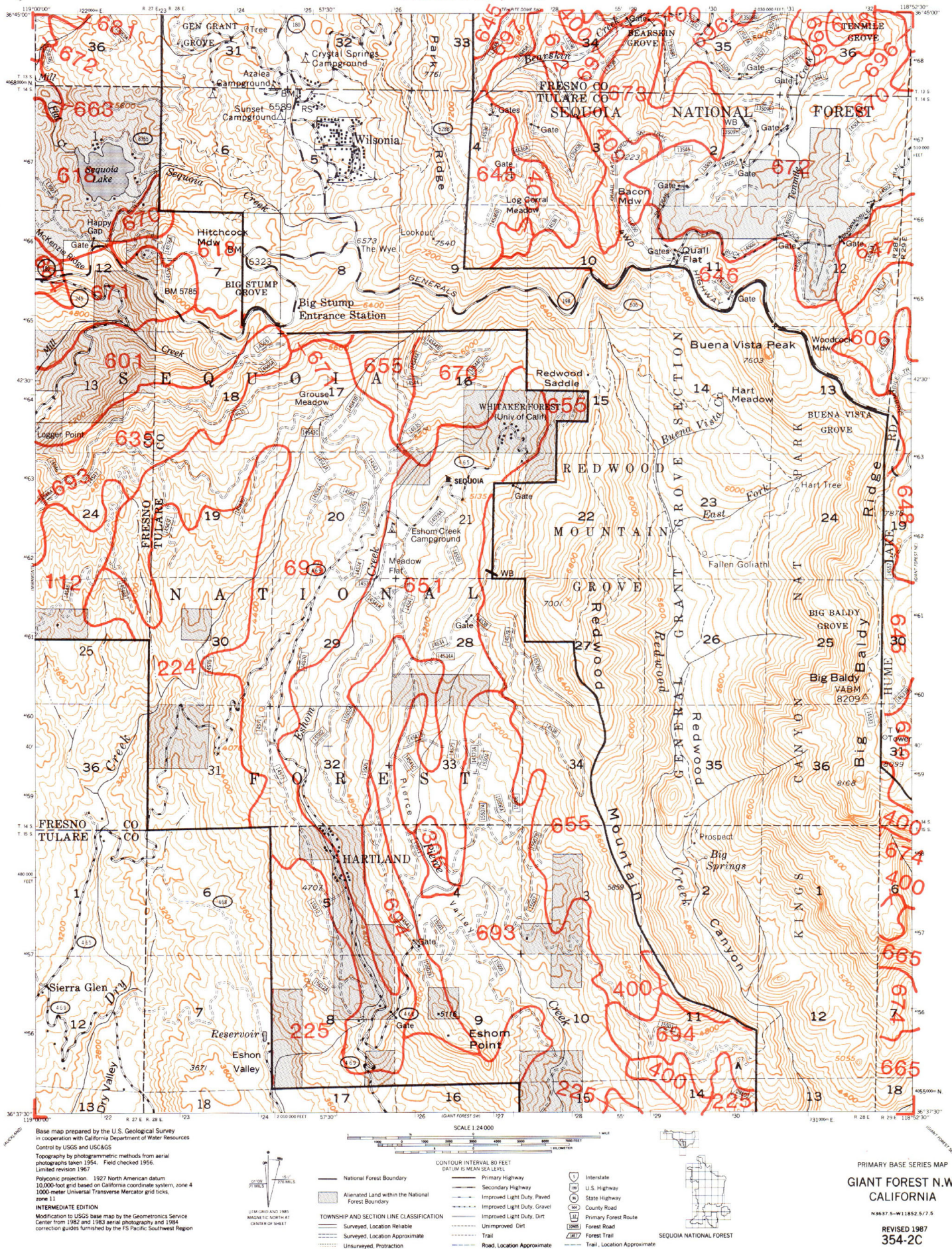
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Legend:

- National Forest Boundary
- Alienated Land within the National Forest Boundary
- TOWNSHIP AND SECTION LINE CLASSIFICATION
- Surveyed, Location Reliable
- Surveyed, Location Approximate
- Unsurveyed, Protraction
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Unimproved Dirt
- Trail
- Road, Location Approximate
- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Forest Trail
- Trail, Location Approximate

SEQUOIA NATIONAL FOREST

PRIMARY BASE SERIES MAP
GIANT FOREST N.E.
CALIFORNIA
13637 5-W-11843 7.5
REVISED 1987
354-1C





Base map prepared by the U.S. Geological Survey
in cooperation with California Department of Water Resources
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial
photographs taken 1955. Field checked 1956
Limited revision 1967
Polyconic projection 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks,
zone 11

INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service
Center from 1980 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

TOWNSHIP AND SECTION LINE CLASSIFICATION

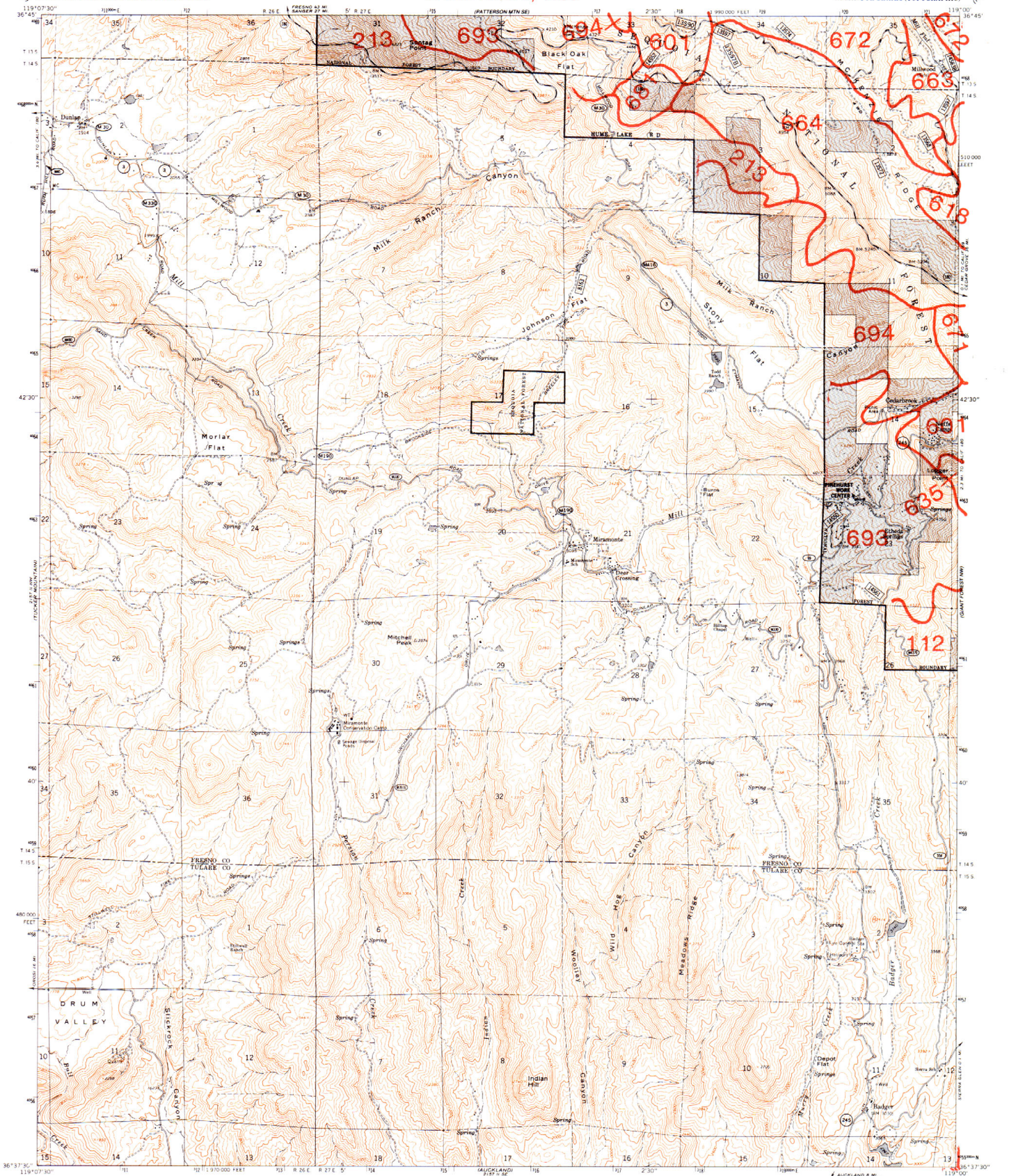
- Surveyed, Location Reliable
- Surveyed, Location Approximate
- Unsurveyed, Protraction

- National Forest Boundary
- Alienated Land within the National Forest Boundary
- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Route
- Forest Road
- Trail, Location Approximate

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

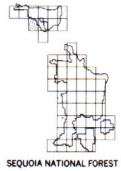
MIRAMONTE QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



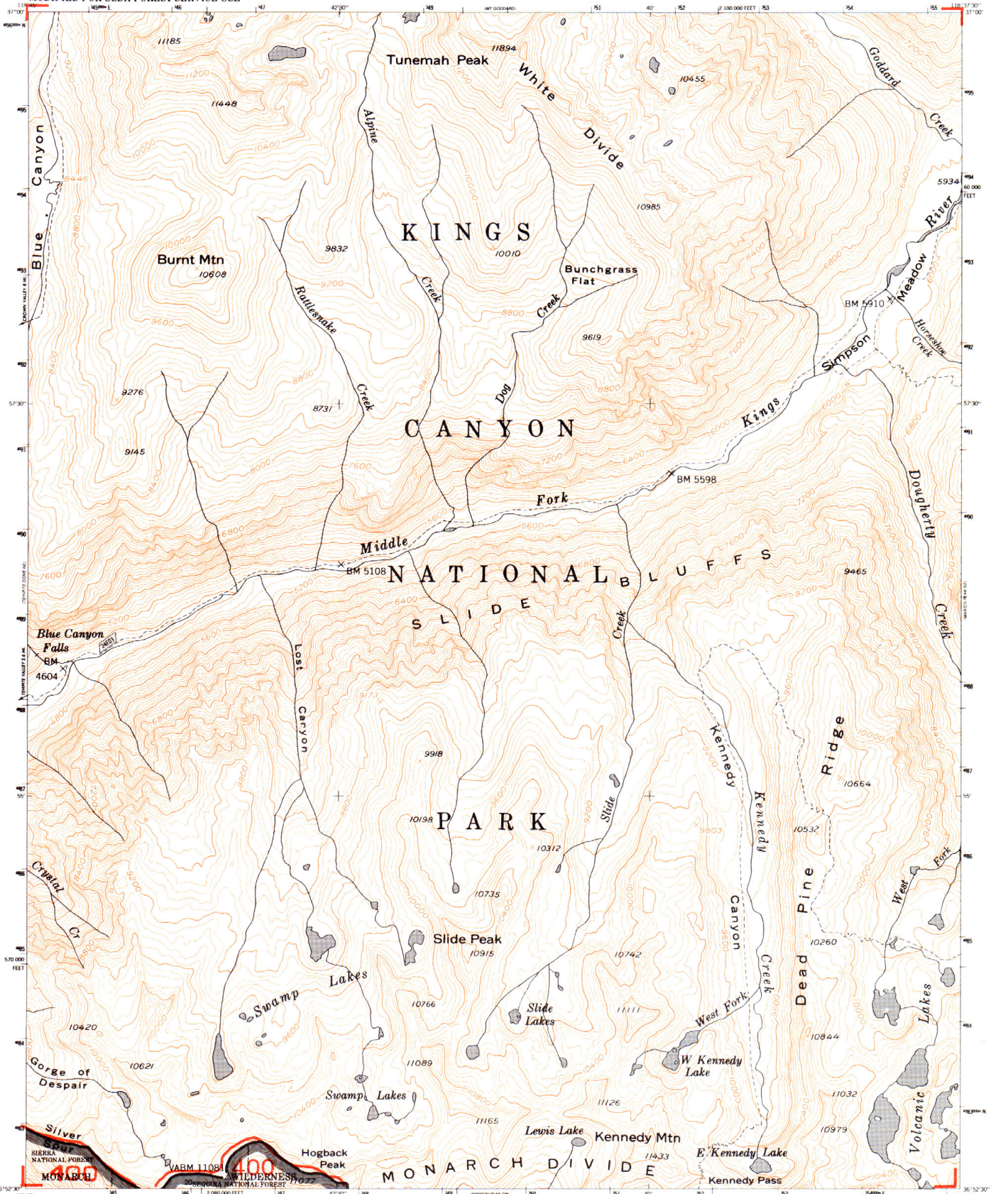
Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial
photographs taken 1963. Field checked 1966
Polyconic projection: 1927 North American datum
10,000-foot grid based on California coordinate system,
zone 4
1:50,000 scale Universal Transverse Mercator grid ticks,
zone 11, shown in blue
Modification to USGS base map by the Geomatics Service
Center from 1982 and 1983 aerial photography and 1984
correction guides furnished by the FS Pacific Southwest Region



- SCALE 1:24,000
- CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL
- | | | |
|----------------------------------------------------|-----------------------------|----------------------------|
| National Forest Boundary | Primary Highway | Interstate |
| Alienated Land within the National Forest Boundary | Secondary Highway | U.S. Highway |
| TOWNSHIP AND SECTION LINE CLASSIFICATION | Improved Light Duty, Paved | County Road |
| Surveyed, Location Reliable | Improved Light Duty, Gravel | Primary Forest Route |
| Surveyed, Location Approximate | Unimproved Dirt, Dirt | Forest Road |
| Unsurveyed, Protraction | Trail | Forest Trail |
| | Road Location Approximate | Trail Location Approximate |



MIRAMONTE, CALIF.
REVISED 1987
DMA 2157 II NE-SERIES VB95
355-1C



Base map prepared by the U.S. Geological Survey

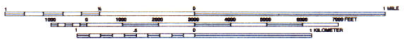
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1948. Field checked 1953.
Polyconic projection 1927 North American datum
10,000 foot grid based on California coordinate system zone 3
10000 metre Universal Transverse Mercator grid ticks zone 11

INTERIM EDITION

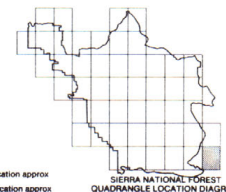
Modification to USGS base map by the Geometrics Service Center from USFS aerial photography and 1976 correction guides

Photorevised by the Geometrics Service Center in 1984 from USFS 1:62,500 and 1:24,000 aerial photographs, and 1984 correction guides furnished by the Pacific Southwest Region.



| TOWNSHIP AND SECTION LINE CLASSIFICATION | |
|------------------------------------------|------------------------------------------------------------------|
| — | Surveyed, Location Reliable |
| - - - | Surveyed, Location Approximate |
| ... | Unsurveyed, Protection |
| --- | Landmark revised according to additional Forest Service evidence |

| LEGEND | |
|--------|------------------------------------------------------|
| — | National Forest Boundary |
| — | Alienated Land within the Forest Boundary as of 1984 |
| — | Primary Highway |
| — | Secondary Highway |
| — | Improved Light Duty |
| — | Unimproved Dirt |
| --- | Trail |
| --- | Locked Gate |
| --- | Barrier |
| --- | Railroad |



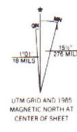
MARION PEAK NW, CALIF
N3652.5, W11857.5
(374-2C)
REVISED 1984

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

MARION PEAK SW QUADRANGLE
CALIFORNIA—FRESNO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Base map prepared by the U.S. Geological Survey in cooperation with California Department of Water Resources Control by USGS and USCAGS
Topography by photogrammetric methods from aerial photographs taken 1948. Field check 1953
Limited revision in 1967
Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks, zone 11
INTERMEDIATE EDITION
Modification to USGS base map by the Geomatics Service Center from 1982 and 1983 aerial photography and 1984 correction guides furnished by the FS Pacific Southwest Region



TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
— Surveyed, Location Approximate
— Unsurveyed, Protraction

ROAD LOCATION APPROXIMATE
— Primary Highway
— Secondary Highway
— Improved Light Duty, Gravel
— Improved Light Duty, Dirt
— Unimproved Light Duty, Dirt
— Trail, Location Approximate

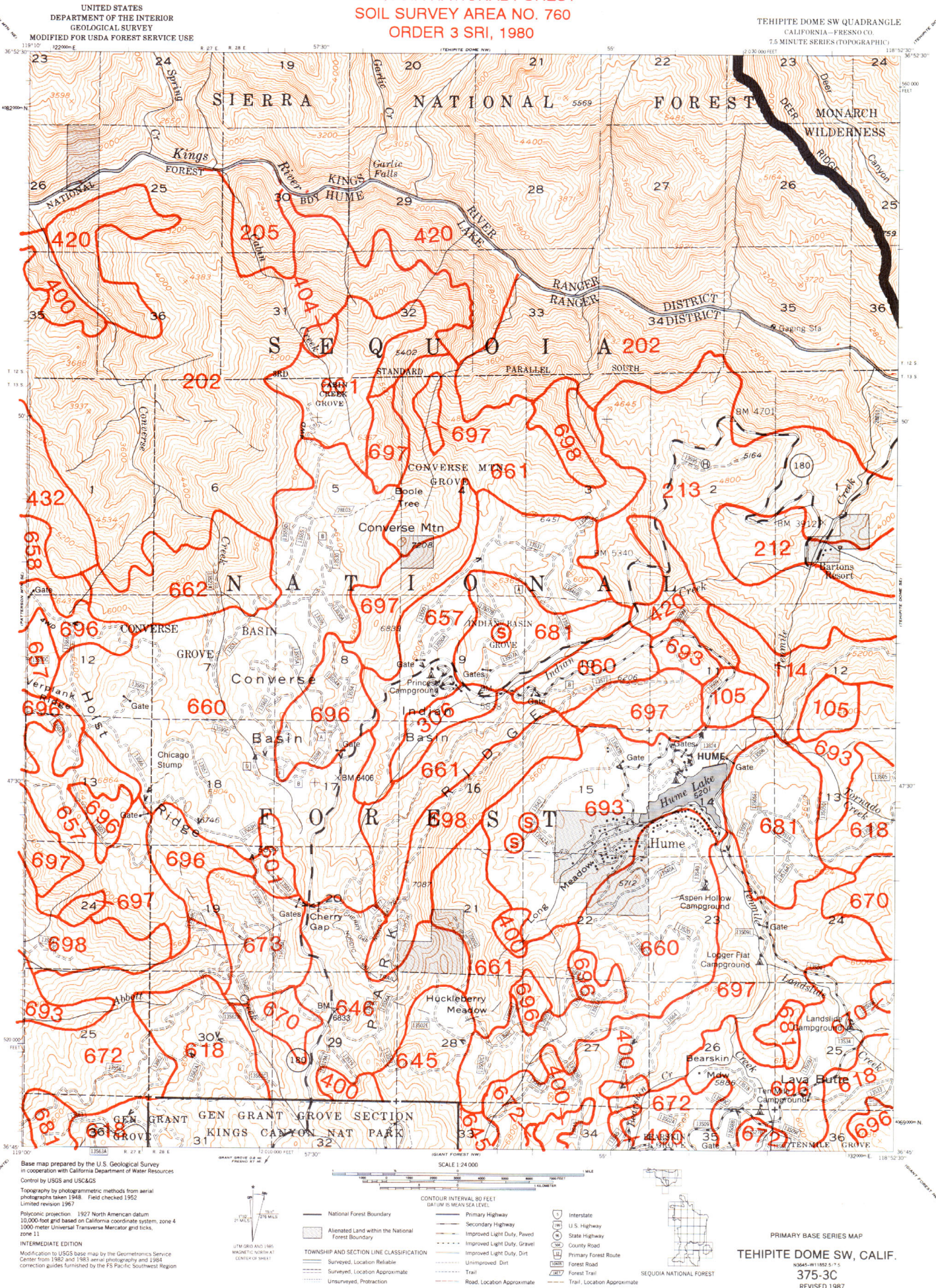
TRAIL, LOCATION APPROXIMATE
— Interstate
— U.S. Highway
— State Highway
— County Road
— Primary Forest Route
— Forest Road
— Forest Trail



PRIMARY BASE SERIES MAP
MARION PEAK SW, CALIF.
374-3C
REVISED 1987

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

TEHIPITE DOME SW QUADRANGLE
CALIFORNIA—FRESNO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

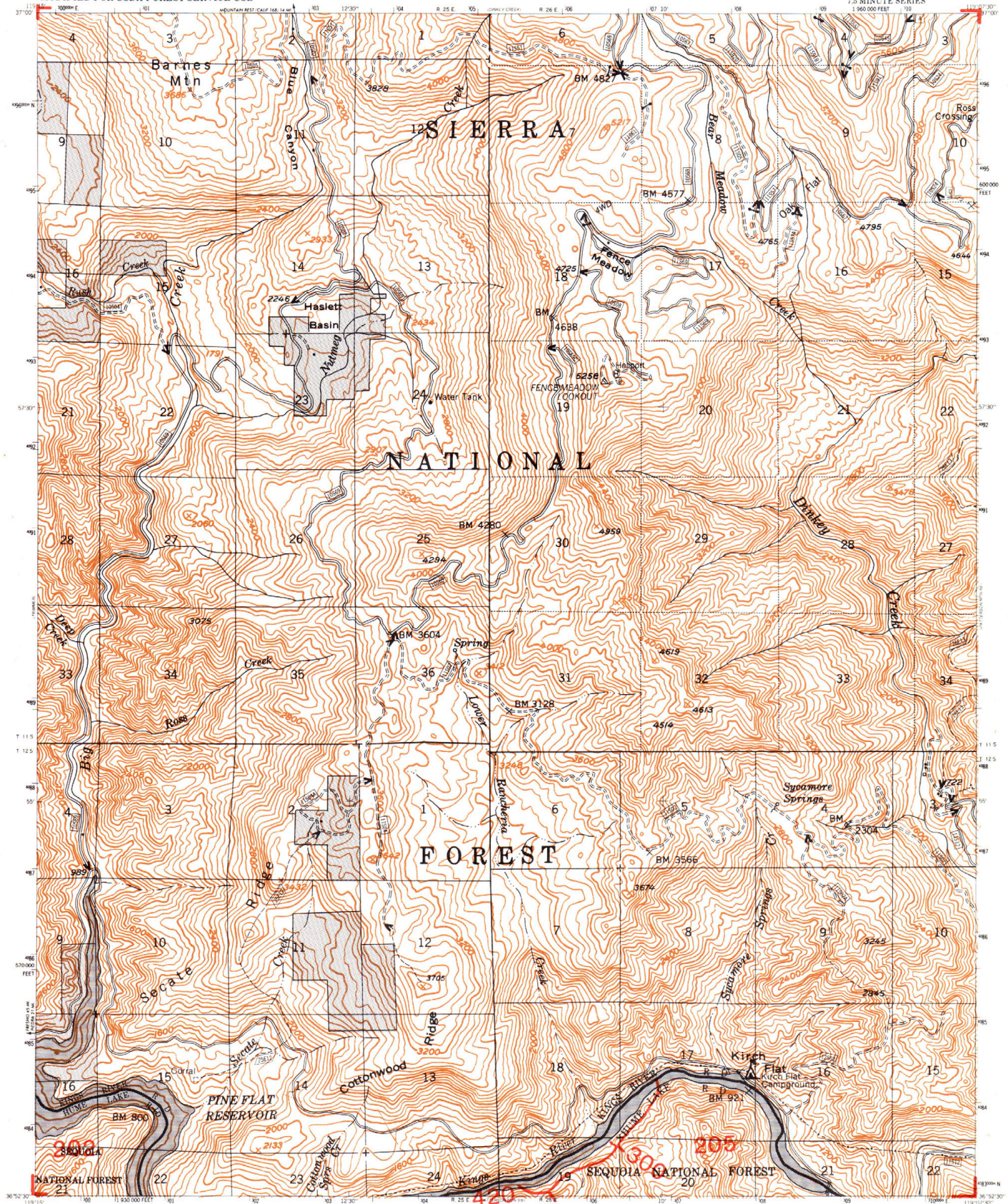
TEHIPITE DOME SE QUADRANGLE
CALIFORNIA-FRESNO CO
7.5 MINUTE SERIES (TOPOGRAPHIC)



SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

PATTERSON MTN NW QUADRANGLE
MT DIABLO MERIDIAN
FRESNO CO., CALIFORNIA
7.5 MINUTE SERIES
1:60,000 FEET



Base map prepared by the U.S. Geological Survey

Control by USGS and USCAGS

Topography by photogrammetric methods from aerial photographs

taken 1948. Field checked 1952

Polycyclic projection 1927 North American datum

10,000 foot grid based on California coordinate system zone 4

1000 metre Universal Transverse Mercator grid ticks zone 11

INTERIM EDITION

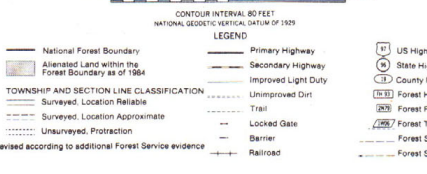
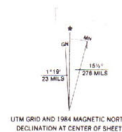
Modification to USGS base map by the Geomatics Service

Center from USFS aerial photography and 1976 correction guides

Photorevised by the Geomatics Service Center in 1984 from

USFS 1982 1:12,000 and 1:24,000 aerial photography and 1984

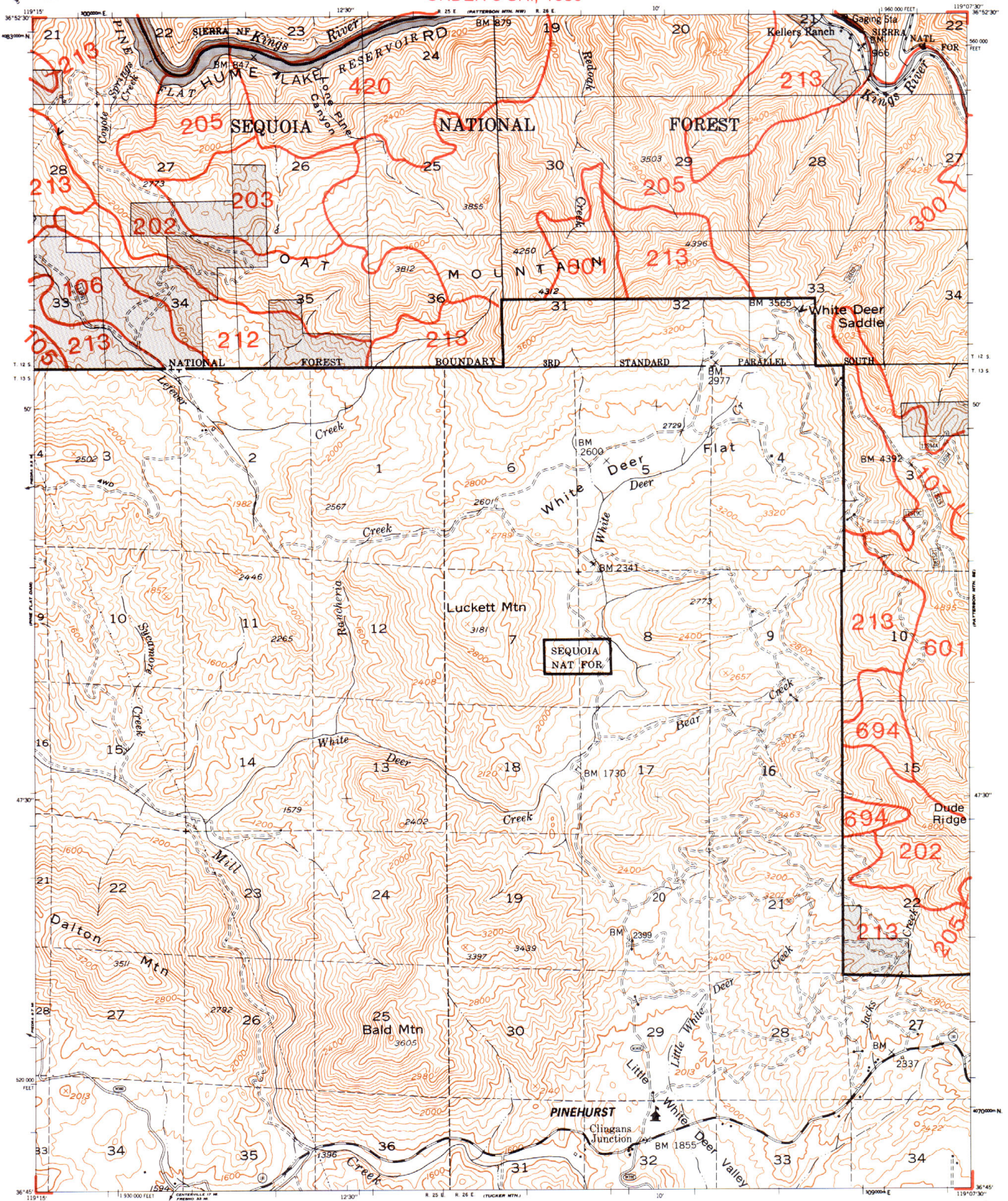
correction guides furnished by the Pacific Southwest Region.



PATTERSON MTN NW, CALIF.
N 3652.5 W 11907.5 T 5
(376-2C)
REVISED 1984

SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

PATTERSON MTN. S.W. QUADRANGLE
CALIFORNIA—FRESNO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Base map prepared by the U.S. Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiple methods

Aerial photographs taken 1948. Field check 1952

Projection: 1927 North American datum

10,000-foot grid based on California coordinate system, zone 4

1000-meter Universal Transverse Mercator grid ticks, zone 11

Unchecked elevations are shown in gray

INTERMEDIATE EDITION

Modification to USGS base map by the Geomorphics Service

Center from 1982 and 1983 aerial photography and 1984

correction guides furnished by the FS Pacific Southwest Region



LTM GRID AND 1980
MAGNETIC NORTH AT
CENTER OF SHEET

TOWNSHIP AND SECTION LINE CLASSIFICATION

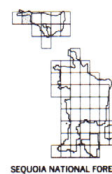
- Surveyed, Location Reliable
- Surveyed, Location Approximate
- Unsurveyed, Location Approximate
- Unsurveyed, Location Approximate

**CONTOUR INTERVAL 80 FEET
NATIONAL GEOGRAPHIC VERTICAL DATUM OF 1929**

- Primary Highway
- Secondary Highway
- Improved Light Duty, Paved
- Improved Light Duty, Gravel
- Improved Light Duty, Dirt
- Unimproved Dirt
- Trail
- Road, Location Approximate

Legend

- Interstate
- U.S. Highway
- State Highway
- County Road
- Primary Forest Road
- Forest Trail
- Trail, Location Approximate



SEQUOIA NATIONAL FOREST

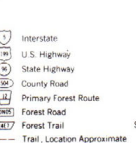
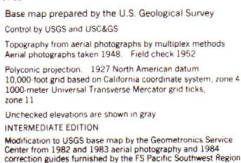
PATTERSON MTN. S.W. CALIF.

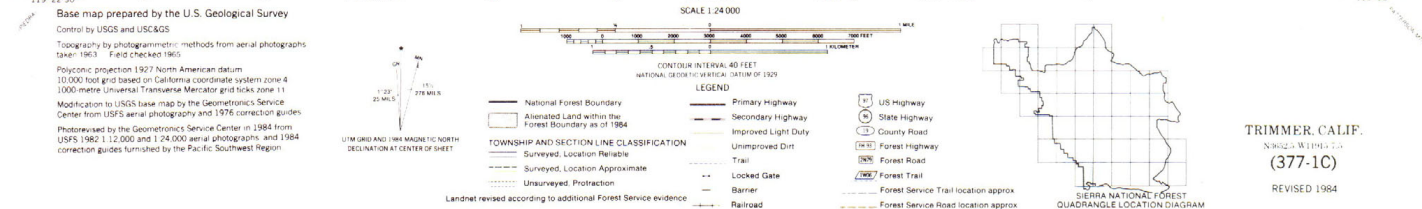
N3645-W11907 5/7.5

REVISED 1987

DMA-2157 1 SW-SERIES Y 759

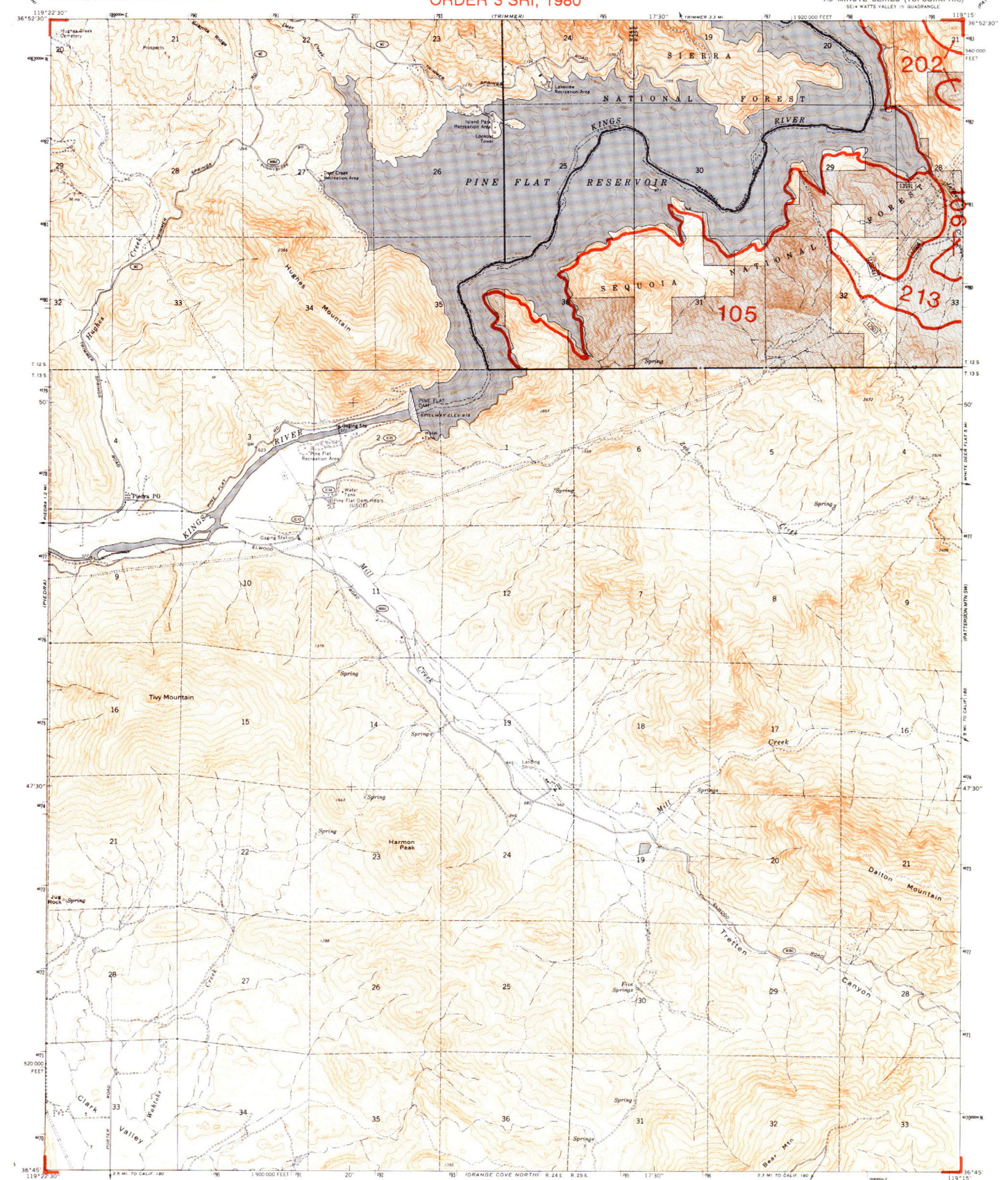
376-3C





SEQUOIA NATIONAL FOREST
SOIL SURVEY AREA NO. 760
ORDER 3 SRI, 1980

PINE FLAT DAM QUADRANGLE
CALIFORNIA-FRESNO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE 1/4 WATTS VALLEY 15 QUADRANGLE



Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial
photographs taken 1965. Field checked 1965.
100 foot underwater contours from aerial photographs
taken 1948, prior to inundation.
Polyconic projection. 1927 North American datum.
10,000-foot grid based on California coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks,
zone 11, shown in blue.
Modification to USGS base map by the Geomorphics Service
Center from 1982 and 1983 aerial photography and 1984
correction Guides furnished by the FS Pacific Southwest Region



- National Forest Boundary
— Alienated Land within the National Forest Boundary
— TOWNSHIP AND SECTION LINE CLASSIFICATION
— Surveyed, Location Reliable
— Surveyed, Location Approximate
— Unsurveyed, Protraction
— Primary Highway
— Secondary Highway
— Improved Light Duty, Pavement
— Improved Light Duty, Gravel
— Improved Light Duty, Dirt
— Unimproved Dirt
— Trail
— Road, Location Approximate
— Interstate
— U.S. Highway
— State Highway
— County Road
— Primary Forest Road
— Forest Road
— Forest Trail
— Trail, Location Approximate



PINE FLAT DAM, CALIF.
SE 1/4 WATTS VALLEY 15 QUADRANGLE
N3645—W1915/7.5
REVISED 1985